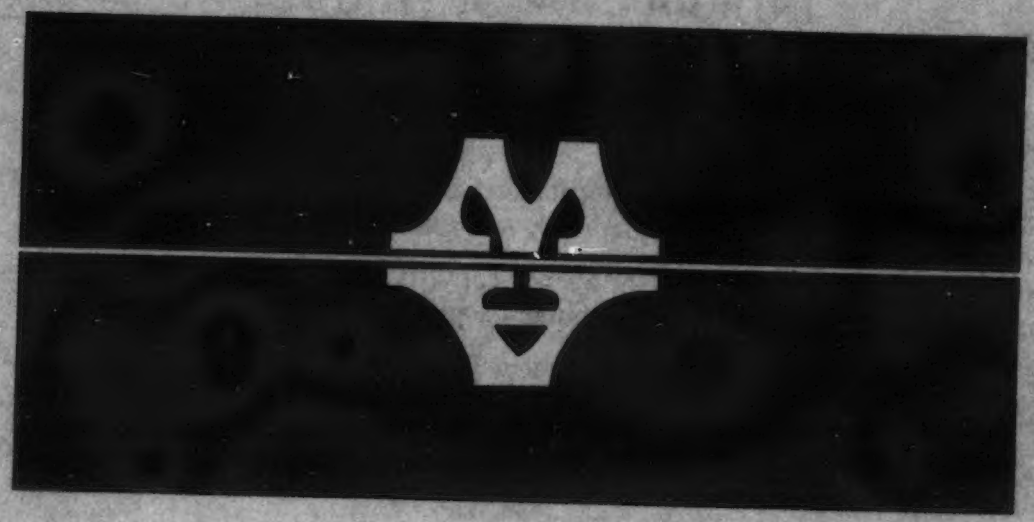
THE

AMERICAN WEST

COVER: Morning in the meadow. For more work by writer-photographer David Cavagnaro, see this issue's color pictorial beginning on page 18.



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Shaped from the trunk of a tree, this sculpture sits peacefully on an island of the Columbia near Castlegar, B.C., where its creator, Alex Zuckerberg, lived.

MICHELLE VIGNES

Science and Art in the Southwest

By Richard Lillard

DEVELOPMENTS in the artistic field have continued in the Southwest for centuries, and in recent years staggering scientific achievements of the Anglo-Americans have been introduced. However, there is a vast distance—not in miles but in culture and purpose—between the few still-existing pueblos of Arizona and New Mexico, and the Atomic Energy Commission's Sandia Base in Albuquerque. The fabled golden cities of Cíbola turned out to be the modest Zuñi villages, but they survive. The vaunted American standard of living, imposed on the deserts of the Southwest, may well turn out to be a treasure as illusory as those of Cíbola. There is a logic to river valleys, to wild living things, age-old scenery, and to human settlements that have survived over hundreds of years.

Culturally, the most coherent communities of the last five hundred years of North American desert history are the pueblo villages of 1530. They combined architecture and urban design, allowed for both private and public life, and made for contented living. They had integrated arts and crafts, dances and rituals, economic and religious systems that had lasted for centuries. They consciously respected the environment and existed as a balanced part of the total ecological system as they saw it in their daily lives long ago.

THE HEARD MUSEUM

An Indian artist demonstrates for young Anglos one of the Southwest's most ancient art forms—sand painting.

Newcomers speaking Spanish or English have altered the original cultures and the settings that held them, yet the remains continue to be the most interesting and durable elements in the scene. The Hopis, Zuñis, and Rio Grande pueblos possess the Southwest's longest-lasting, strongest, and most artistic of civilized traditions.

Second historically, as Roland F. Dickey makes clear in his *New Mexico Village Arts,* is the culture of descendants of early Spanish colonists, whose styles of architecture, household furnishings, religious carvings, paintings and painted borders, and tools give residual charm to Chihuahua and New Mexico.

The individualistic Americans are a weak third, despite their wealth in dollars, possessions, and relative size of population. They have positioned themselves on the land and imported bits of heterogeneous culture from Europe, Asia. Africa, and elsewhere in the United States. A constructive minority of Americans have encouraged Indian and Hispano

PHOENIX ART MUSEUM

American graphic art flourishes in the Southwest today; this oil by "Rip" Woods is titled "Scrutinous."

artists to create and re-create in their ancestral idioms.

American and European archaeologists, such as the earlier Bandelier or the later Edgar Lee Hewitt, studied the Indians as architects and artists. Charles F. Lummis and fellow writers publicized the pueblos and encouraged native artisans like Maria, maker of black pottery at San Ildefonso, and her successor, Rose Gonzales. It was Lummis, a friend of Theodore Roosevelt, who coined the name *Southwest* and urged the slogan "See America First." Before World War I painters were discovering the area, especially New Mexico. Today there are perhaps more producing artists per capita in New Mexico than in any other state. In its great days of carrying passengers, the Santa Fe Railway hired Mary Jane Colter to copy on dishes the conventionalized birds, animals, monsters, and insects that appear on the pottery of the prehistoric Mimbres people, whose balanced, colored decorations equal those of ancient Etruscans and Greeks.

Creative writers responded to the pull of the upper Rio Grande towns, the Navajos, and the California deserts. Scores of popular writers have worked or reworked southwestern frontier materials—the Apache wars, cowboy life, mining booms, Mormon settlements. For more than a century strong scenery and the faces of native peoples have attracted master photographers.

Archaeologists and historians, writers, and artists continue steadily to examine the region, with the most yet to be done

PHOENIX ART MUSEUM

The architect as artist: Paolo Soleri's concepts offer another element in an already tangled architectural heritage.

with the Mexican strip from Baja California eastward into Coahuila. Painters, sculptors, and craftsmen are numerous wherever collectors and free-spending tourists congregate, in Palm Springs, Scottsdale, Sedona, Old Town in Albuquerque, Taos, Juárez–El Paso, or Santa Fe with its Canyon Road, a winding riverside lane with dozens of shops, studios, and workshops for pottery, paintings, drawings, purses, trays, books, and other items.

There are annual cultural events such as the three-day Firebird Festival of Arts in the new sixteen-acre Civic Plaza in downtown Phoenix, the Indian Market in the Santa Fe Plaza, or the extraordinary Santa Fe Opera, which each summer brings singing stars from the world around to its two-month series of grand operas given in its outdoor opera house on a hillside away from town. The 1971 season was its fifteenth.

The artistic vitality of the region shows itself in architecture,

PHOENIX ART MUSEUM

"Watchers from the Housetops": Regional artist Maynard Dixon left a record of the cultural crossroads.

EDITOR'S NOTE—This article is adapted from The Great Southwest, *by Richard Lillard and Elna Bakker, to be published in the fall of this year by American West Publishing Company.*

bulkiest and most three-dimensional of the arts. Conspicuous throughout the Southwest are admirable adaptations of traditional style. Many buildings in the Mission style have large, semicircular arches, low-pitched tiled roofs, parapets, smooth-plastered walls, balconies, and towers or turrets capped by domes or pyramidal tiled roofs.

More elaborate in style is the Spanish Colonial Revival. Again there are the red-tiled roofs with a low pitch, but there is ornamentation around the doors and windows. Columns or pilasters flank the doorways, the balconies have railings of wrought iron or wood, and windows have grills *(rejas)* of iron or wood with turned spindles.

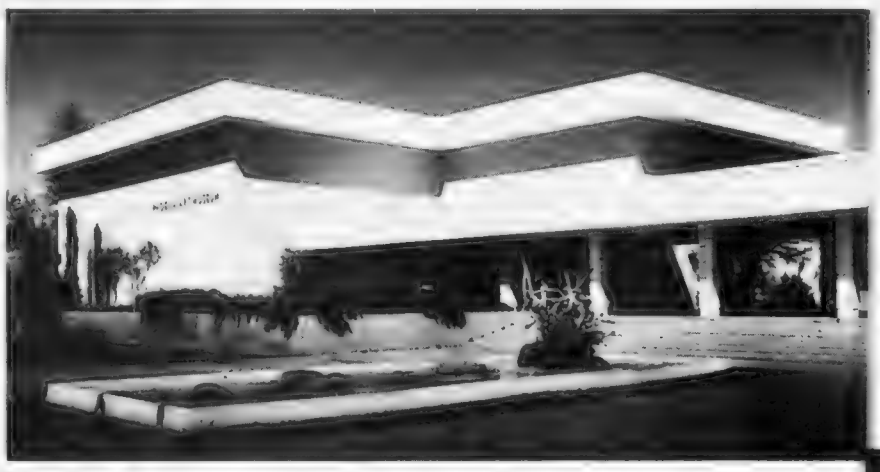
The Pueblo style, native to New Mexico and Arizona, appeared in California in the 1890s. In New Mexico it had its Anglo beginning in 1905 in a building at the University of New Mexico. The style set the motif there and the university has grown into "a gigantic academic pueblo" with adroit functional adaptations and a distinctive appearance. Pueblo style means massiveness and no arches; buildings are of adobe or of materials made to look like adobe. The walls have blunt angles and look battered. Roofs are flat, and there are stepped-up roofs for upper stories, as at Taos Pueblo. Beams *(vigas)* project to irregular lengths. Homes in New Mexico employ this simple, sturdy, impressive, indigenous style, as do hotels and motels all over New Mexico and Arizona. The Albuquerque airport, built in 1966, adapts Pueblo to the requirements of an aviation terminal.

Some homes and office buildings are modernistic, as are banks and department stores in Phoenix and Tucson or Luhrs Tower in Phoenix, designed by the Trost brothers of El Paso. The influence of Frank Lloyd Wright shows in buildings such as the Phoenix Art Museum, designed by Alden Dow. At his studio in Scottsdale, Paolo Soleri advocates Neo-Expressionism—sweeping curves and arches and vaults in many forms.

Colleges and universities contribute increasingly to the cultural life of their towns. The University of Texas in El Paso, with its Bhutanese architecture, the state universities in Albuquerque and Tucson, both with busy presses, and the two former agricultural colleges that have now become New Mexico State University and Arizona State University—all are expanding their liberal arts and artistic offerings.

In 1894 Percival Lowell, at his observatory on a hill near Flagstaff, began his studies of the planets, especially Mars. He pushed the rise of astrobiology as he examined the ruddy deserts of Mars, the channels, the severe climate, and the dark areas that could be mosses or lichens. He argued for

PHOENIX ART MUSEUM



The low, flat sweep of the Phoenix Art Museum reflects the character of the Arizona landscape.

THE HEARD MUSEUM

The Heard Museum of Phoenix revives the tiled roofs and simple arches of the Mission style.

the existence of life on the red planet. In the cold, clear atmosphere of Flagstaff, seventy-two hundred feet in elevation, he demonstrated that a small instrument in good air will show much more than a large instrument in humid, overcast air like that of Paris. Lowell's data, assembled between 1894 and 1916, stand up under the latest techniques of astrophysics and will help the National Aeronautics and Space Administration plan its scheduled manned Mars landing sometime around A.D. 2000.

While experts at Lowell Observatory were looking into space, Professor Andrew E. Douglass of the University of Arizona was probing backwards in time and providing archaeologists in the Southwest with a precise calendar that goes back to 273 B.C. Douglass pioneered dendrochronology—dating by tree rings. In wet years trees grow more before slowing down and depositing an annual ring. In drought years they barely grow at all, and annual rings harden close together. Working from cross sections of living trees in years

of known weather records, Douglass matched the overlapping tree-ring record in beams or timbers in Anglo, Mexican, Spanish, pueblo, and prehistoric cliff dwellings and in the charred embers of ancient campfires.

Arid lands have long interested scientists because of the dramatic visibility of the geological history and the special adaptations made by wild living things. In the 1880s and 1890s Dr. C. Hart Merriam of the U. S. Biological Survey noted the layers of biological differences from one elevation to another, from the bottom of the Grand Canyon to the top of the San Francisco Peaks, and developed the concept of North American life zones. And as Mexicans and North Americans now crowd into the deserts, scientists are particularly busy, either studying nature before it is irreversibly destroyed or studying procedures that will support human life in denatured, million-automobiled cities. Big foundations are behind some of the research; so are state agencies and the federal government.

In Arizona there are biological study stations at El Portal, southwest of Lordsburg and near the Chiricahua wilderness, and south of Tucson in the Santa Rita Range Reserve. There is also the Southwestern Arboretum near Superior. With sums from the National Science Foundation, scientists in the Committee on Desert and Arid Zones Research study all the kinds of ecosystems in the desert. They investigate the life processes that involve higher plants, vertebrates, invertebrates, microorganisms, and aquatic organisms, as well as matters such as temperatures, the movements of waters and salts in the soil, and the processes of evaporation.

ALAN KEITH STOKER

The style of the Santa Fe Opera House—with its vaults and curves—is borrowed from three cultures.

In several areas Forest Service researchers experiment with prescriptive burning to simulate natural fires and avoid the buildup of litter for occasional great conflagrations. At range experiment stations experts study the use of grass and water on cattle range lands. The Soil Conservation Service works out means of rescuing eroded land. In Chihuahua Dr. Martin H. Gonzales directs investigations at La Campana Livestock Experiment Station.

In western Texas the state Water Development Board, the Air Force, and the Bureau of Reclamation experiment with cloud seeding. They distribute silver iodide to produce the freezing of water droplets in clouds, which releases heat and may in turn make the clouds grow and produce rain. NASA and its Mexican counterpart cooperate to use aircraft and satellites in taking infrared photographs and using other remote-sensing devices. These enable men to study underground water systems, geological formations and ore bodies,

CHARLES LUCKMAN ASSOCIATES

Like mountains and plains, the Phoenix Convention Center integrates massive thrusts and broad expanses.

plant diseases, the condition of crops, and the species of plants growing, such as marijuana. The cooperative Mission Screwworm concentrates on eradicating the screwfly and its larvae, destructive to cattle herds along the Mexican borderlands from Texas to California. In the summer of 1970 aviators of the mission dropped 670 million sterilized male screwflies in the active program of biological control. Arizona men have pioneered in a similar sterilization program to control the pink bollworm. Thus local economic concerns push men toward wiping out species that nature provides a place for in the great chain of being.

The high, clear heavens above the great deserts have for decades played a mighty role in big space exploration, nuclear science, and war—hot or cold. To a notable degree the nuclear age is physically a southwestern product, a result of the huge, almost unpopulated spaces, mostly government owned, and of the transparent skies, formerly the realm of the Great Spirit.

"During recent years," as the National Science Foundation discreetly says, "the growing importance of scientific research to the national welfare has given rise to new activities and agencies within the federal government." One result is the complex of facilities for astronomical research at Brookhaven National Laboratory, New York; Green Bank, West Virginia; Boulder, Colorado; at the Cerro Tololo Inter-American Observation center in Chile; and at Kitt Peak National Observatory, Arizona.

The Kitt installation, founded in 1958, perches atop a mountain 6,875 feet above sea level, just inside the Papago Reservation. An association of universities operates the complex for the National Science Foundation. It was put here because of absence of dust, fog, airplane vapor trails, smog, industrial smoke, and city lights at night. Adjacent to a series of special telescopes for stellar studies—from sixteen to eighty-four inches—is the world's largest solar telescope of its kind. This device, dug deep into the rock of the mountain, makes possible a variety of detailed studies of the magnetic field of the sun, of sunspots, flares, granulation prominences, the light spectrum, and other solar phenomena. In the planning stage are large telescopes that will be automated to operate for years from outer space.

At Kitt Peak the once "pure" science of astronomy is now potentially reddened with the blood of human beings, for astronomy is part of the competitive military-space program of the Pentagon. And in older southwestern observatories men work with a stepped-up urgency that star study did not have in the days of Bruno and Kepler or Percival Lowell. At Lowell Observatory on Mars Hill, astronomers use computers to scan the sky to determine for practical purposes the size, mass, composition of specific stars, the distance from earth, and the movement in space. At the University of Texas McDonald Observatory in the David Mountains, astronomers with grants from NASA are studying the surfaces and atmospheric characteristics of the planets of the solar system. In early 1971 their 107-inch mirror, part of the world's third largest telescope, made laser contact with a reflecting prism that the Apollo 14 astronauts had placed on the moon.

Although studying natural objects in space is a major enterprise, there are installations, too, for sky-watching artificial objects out in international space. The U. S. Air Force runs an electro-optical facility on the mountain top at Cloudcroft, New Mexico. There military and civilian scientists use highly complex electronic equipment, an IBM computer, a 48-inch reflector telescope, and a camera that takes two hundred photographs per second. They photograph distant

The Kitt Peak National Observatory, perched high above the smog and smoke that are a growing by-product of the region's technological explosion, pursues stellar and solar research.

"KITT PEAK" NAT. OBS. PHOTOS

The McMath Solar Telescope at Kitt Peak, poised like a flying buttress against the sky, is the world's largest instrument for probing solar phenomena.

satellites, even though these streak from one horizon to the other in from twenty to forty seconds. The object is to solve some of the problems involved in photographing very distant objects. By diplomatic arrangement the United States has placed a Space Capsule Tracking Station in Sonora between Navojoa and Ciudad Obregón; it observes astronauts as they pass over. The Goldstone Tracking Station near Barstow in the Mojave has huge dish antennas that not only watch men in the sky but also measure the size and structure of quasars (energy sources) and radio galaxies.

Scientific activities more obviously interlocked with military preparedness and training take place at Albuquerque's Kirtland Air Force Base, a research and development center, and the Atomic Energy Commission's Sandia Base with its Special Weapons Project. Holloman Air Force Base includes the Air Force Systems Command at Alamagordo, near the White Sands Proving Ground. Other installations are Walker Air Force Base at Roswell; Fort Huachuca, Arizona, headquarters of the Defense Department's Strategic Communications Command; and Luke Air Force Bombing and Gunnery Range in western Arizona. In addition, great chunks of California desert are occupied by the Marine Corps Training Center north of Twentynine Palms; the Air Force Flight Tests Center at Edwards Air Force Base north of Lancaster; and the Randsburg Wash Test Range and the China Lake Naval Weapons Center, where thousands of scientists and technicians live in isolation.

Most important among all these scientific developments in the shaping of history are the activities of the AEC at Los Alamos and elsewhere in its dispersed domain. Applied science in the whole region, the nation, and the world reached a climactic period during World War II in the temporary army camp shacks of Los Alamos.

Here, amid pine forests and stunning vistas—in a secret town reached by outsiders (even Franklin D. Roosevelt) only by means of P.O. Box 1663, Santa Fe—J. Robert Oppenheimer and an extraordinary group of fellow scientists and technicians carried on research, devised, and partly assembled the first atomic bomb. The Los Alamos Laboratory, known as Project Y, was the crucial center of the nationwide research and development program called Manhattan Engineer District. It involved intricate coordination with laboratories in Berkeley and Chicago, and radically new plants in whole new cities, Hanford, Washington, and Oak Ridge, Tennessee. After

strenuous research, after facing multifarious problems and a horde of unknowns, the scientists realized that they had to test an actual nuclear detonation.

They chose an empty site on a ranch astride the old Jornada del Muerto; Oppenheimer called it Trinity. There was a trial run on May 7, 1945, with a hundred tons of TNT and an interspersing of fission products. The big test came two months later..

After elaborate secret movement of materials, provisions for observation and measurement, and for safety for scientists and technicians, the first plutonium bomb was ready for implosion at Trinity. Carefully assembled, the bomb lay at the top of a high steel tower. Oppenheimer, Vannevar Bush, Enrico Fermi, Edward Teller, Ernest O. Lawrence, and other scientists arrived, as did Gen. Leslie R. Groves, director of Manhattan District.

Came the predawn hours of July 16, 1945. The result of three years' work and two billion dollars in expenditure could possibly soon set the atmosphere on fire and extinguish all life on earth. No one knew for sure what would happen. General Groves had brought psychiatrists to calm the scientists, but now psychiatrists were trying to calm each other. Since the skies were rainy, the test was postponed several times, but shortly before 5:30 A.M. the countdown began.

At the final count of zero a point of light became a small sun, the steel tower completely disappeared into microscopic bits, and a huge incandescent column spewed over and engulfed the desert in light as no noon sun ever had done. The center of the fireball was perhaps four times as hot as the sun's center and ten thousand times as hot as the sun's surface. A multicolored cloud surged up eight miles, evaporating the clouds in its path. Earth trembled. A pressure of a hundred billion atmospheres pushed down, creating a huge, sloping crater, melting a layer of earth into greenish glass, lumpy with holes—trinitite. A security guard sensed doom: "Jesus Christ! It's got away from the long-hairs." Twenty miles away on Compania Hill, Ernest Lawrence shouted, "It works! It works!" Near Albuquerque, 120 miles to the north, a blind girl suddenly asked, "What was that?"

The thunder and blast wave spread, echoing and re-echoing between distant ranges—the Organs, the Sierra Oscuro, the Little Burros. Reflective scientists were profoundly affected. Said one: "It was the nearest to doomsday that one could possibly imagine." Another thought of Krishna: "I am become Death, the shatterer of worlds." A young scientist remarked, "Now we are all sons-of-bitches!" Gen. Thomas Farrell, Grove's deputy, saw atomic fission as "almost full grown at birth. It was a great new force to be used for good

Technological sand painting: An orderly array of instrument trailers gather around an underground nuclear test site in Nevada, ready to gather information through cables.

LAWRENCE RADIATION LABORATORY, NEVADA

LOS ALAMOS SCIENTIFIC LABORATORY

Huge craters left by previous blasts are the only vestiges of the modern scientific violence that Yucca Flats, Nevada, has known. Drill rig (top) prepares a shaft for another blast.

or for evil." Groves himself, as he later recalled, had no time to reflect on how world history had exploded itself into a new era. "As for me, my thoughts were now completely wrapped up with the preparation for the coming climax in Japan." It came soon, on August 6 at Hiroshima and three days later at Nagasaki.

The Trinity Site can now be visited one day a year, each October. At Los Alamos, where the laboratories grow more numerous in a modern postwar city, the Science Hall and Museum, open to the public, exhibits models of the bombs that destroyed the Japanese cities—to save lives—the only such bombs ever used in warfare. A plaque says that "they represent one of the greatest scientific achievements of all time."

AFTER THE END of the war with Japan, subsequent tests of military products of the Los Alamos Scientific Laboratory were peacetime experiments on Bikini, Eniwetok, in the South Atlantic, in the Pacific near Johnston or the Christmas islands, and the continental United States, especially in Nevada. The Nevada Test Site, now inside Nellis Air Force Range, became a site to supplement the Pacific proving grounds and speed up the assessing of test results. It has become the nation's "outdoor nuclear explosives laboratory" for both military objectives and civil uses. Since 1951 this area of approximately eight hundred fifty thousand acres, a domain of peaks, valleys, and dry lake beds with an internal drainage system, has changed into a far-flung intricate military-industrial-scientific complex.

During the period from 1951 to 1970 the AEC announced 381 United States weapons tests and twenty-two detonations in the Plowshare program. The detonations, each with its own name, such as Stanley, Fawn, Wineskin, Cruet, Spider, Tijeras, or Wish Bone, took place on towers, in the air, and underground from near the surface to several thousand feet down, in limestone, dolomite, tuff, alluvium, or rhyolite. Since 1962 all weapons tests have been underground. The tests have been designed mostly at Los Alamos or at the Lawrence Radiation Laboratory in Livermore, California. Also involved is the Sandia Laboratories at Albuquerque, which operates the Tonopah Test Range, a separate AEC field-test installation, north of the Nevada Test Site.

Continued on page 63

AMON CARTER MUSEUM

An exaggerated depiction of a buffalo jump.

SUPERBEAST AND THE SUPERNATURAL

The Buffalo in American Folklore

By Larry Barsness

IN THE STEPS of the earlier plainsmen, who had seen plenty of buffalo and heard and embellished and spread many tales about them, Charles Goodnight, the well-known rancher of pre-World War I Texas, made a place for himself in the heritage of buffalo mythology in the American West. Ardent perpetrator and sentimental victim of the superbeast notion, he knew as much—and as little—about the creature as anybody. For fifty years he kept two hundred of them on his ranch, and claimed they were smarter and hardier than his beeves—and carried more meat, too. Early in his buffalo keeping he crossed cattle and buffalo in hopes of producing a superwonderbeast, the "cattalo." When this alchemy failed and his ranch fell into serious financial difficulties, he and his wife aimed at what they thought was a big potential market for buffalo meat, wool, hide—and medicinal tallow. Superbeast was their last hope, and they looked for a miracle through him. Mary Goodnight wrote during those bad, latter days, "I cannot think of much of anything but the possibility of doing something great with the buffaloes for humanity."

Buffalo tallow, Goodnight claimed, was medicinal. In 1916 he sent batches of it to E. C. Seymour in New York, president of the American Bison Society (so much that Seymour complained, "What in thunder will I do with this buffalo fat?"). When Seymour sent some to Dr. Robert T. Morris, Madison Avenue physician, to have its supposed medicinal benefits assayed, Morris answered that he couldn't experiment until he knew what it was. "Tell me what is in the bottle and I can charge somebody twenty-five dollars for finding out if I have hurt him by using it." Another doctor commented that Buffalo Balm's viscosity would be good for automobile gears. On the other hand, Goodnight received a request for another twenty pounds of the stuff from Dr. Tillotson of Los Angeles, who said he had used it on rectal cases and the privates with "great benefits." Goodnight wrote Seymour later in the year of other qualities of tallow: it was a fine preservative—mixed with mince and unrefrigerated, it remained edible for over a year.

Buffalo home remedies had been praised by others before Goodnight. Early prairie travelers thought they could detect improvement in a sick man who could keep down a pint of water mixed with a gill of buffalo gall, saying that it braced the nerves, restored the appetite, and helped digestion, as well as cured ulcerated stomach—although its use at first might be "noisome" and make some people vomit. Josiah Gregg, who traveled the Santa Fe trail, believed buffalo meat had a "gentle laxative effect" (many travelers found the effect not so gentle; they complained of violent diarrhea following first buffalo meals). Another prairie traveler claimed that he drank six full gills of liquid buffalo fat drippings, for "the stomach never rebels against buffalo fat."

The Goodnights' new claims expanded this traditional folklore. Charles wrote Seymour again in 1916 about their "discovery" of buffalo soap: "It is not soap at all but so made. . . . Now we take this soap and mix it with water and it makes a compound with far reaching qualities. It has no taste and smell of soap and has qualities unknown to us. . . . I am satisfied it will relieve rheumatism. By all means have it tried on

"Buffalo Jones"—adventurer, bison hunter, and frontier visionary—traveling around his ranch in style. COURTESY OF THE AUTHOR

infant paralysis. Try it for tuberculosis. I do believe it will work. It is harmless. We do not know what we have found. Help me hunt it out. I believe it stands a fair chance to become the discovery of the age." And Mary wrote, "You tell your doctors for me that I have been working over the soap for six or eight weeks [!] and know whereof I speak."

In addition to its medicinal qualities, buffalo soap, Goodnight claimed, could be used to clean oil paints, to clean "silver and book of all description," as a "disinfectant," or to "kill insects." He'd found a supersoap from the superbeast—a concoction the King and the Duke might have brewed on Huck's raft.

Sometime later Goodnight clipped "superior" wool from the buffalo and made it into blankets "superior" to the ordinary sheep's wool product. He saw curative power in these blankets, too, for they sparked in the dark, not like phosphorous, but like electricity, for "some claim they can feel the shock." A beast with electric wool, Goodnight felt, was worthy of experiment by Edison or endowment by Carnegie. But these gentlemen proved uninterested in beastiology.

Like Goodnight, the earlier plainsmen had fabricated lore about a superbeast to explain what they had seen and heard of buffalo doings—folklore describing a latterday unicorn.

Men had watched him rub and wallow. They'd seen trees debarked and prairie boulders polished from his rubbing. They know his strength. They told how the buffalo, by means of his rubbing and butting and pawing, had cleared the prairies of trees from the Mississippi to the Rockies.

Knowing that enough of the beasts existed to clear that broad area, plainsmen calculated that it took exactly seventeen million of them; exactly, for plainsmen figured this to be the amount necessary to replace the annual kill with calves.

These sixty-eight million cloven hooves were said never to crush an unnecessary blade of prairie grass (which had sprung up in place of the trees), because the beast traveled in single file, placing each hoof "in the exact print" of those before him. Buffalo so insisted on this method of procedure, says legend, that each animal grazed close to his place in line; and when the herd left the rendezvous, they "departed in single file according to the exact order of their arrival." If the lead buffalo wallowed, all wallowed—somewhat as pelicans flap their wings in follow-the-leader fashion.

How such a daintily-stepping creature could be the same natural engineer that scuffed out the buffalo trails, choosing always the easiest grade, is not clear. Yet those who saw the buffalo as superbeast swore he did, claiming that the "best roads to Onondargo, from all parts are the buffalo trails," and that buffalo had chosen one two-hundred-mile trail as well as a surveyor might have; claiming that many of the early railroads followed buffalo trails and that on the B & O, between Grafton and Parkersburg, West Virginia, "in two instances the trail runs exactly over tunnels"; claiming that "the Union Pacific up the valley of the Platte follows buffalo trails practically all the way from Omaha into the Rocky Mountains." Such hyper-enthusiasm for buffalo know-how overlooks the fact that deer also feel out an easy grade, elk find natural

MONTANA HISTORICAL SOCIETY

Michel Pablo bought a fabled bison herd which appeared mysteriously in Montana in 1872.

COURTESY OF THE AUTHOR

Jones, looking dapper yet ready for blizzard or grizzly, once swore to clothe himself in bison products alone.

passes. Men credit them with no superskills. And as for the trails supposedly following the Platte, Peter Burnett complained about traveling the Oregon Trail because buffalo trails ran at right angles to the river. Heavy wagons, jolting westward, often broke wheels or axles *crossing* the trails, not *following* them. George Washington thought a road "crooked and not well-chosen" because it followed a buffalo trail.

The beast has no built-in Abney level.

Such a mythological creature, a rival of Bunyan's Blue Ox, was not imperiled by winter's snow, for he was "known" to burrow under the snow and there, in snug tunnels, graze at his ease and comfort while the blizzard howled overhead. In Bunyanesque fashion, if any Blue Calf was wounded, Blue Ma and Blue Auntie always came back after him, through the hails of lead, and, supporting between them whichever end was incapacitated, helped the child off the field. So said Buffalo Jones, the Kansas Buffalo capturer, who also claimed Blue Ma would horn a lariat from her roped calf to free it.

Another recurrent folktale says that superbisons, when hunted on the open prairie, always ran to the left "in the direction of the sun"—left, to a man facing north. They did, not because they were addicted to lefthand turning, but because righthanded hunters, coming at them from the right in order to be in a natural shooting position, naturally milled the herd to the left, in the direction of the sun—to a man facing north.

Numerous myths were fitted to the superbeast image. Canadians and Americans saw an American herd, sold to Canada, charge out of the railway cars onto the Albertan prairie and *unerringly* pick out grass-grown trails and wallows disused for twenty-five years. Ernest Thompson Seton, the naturalist, wrote that a herd always tended to work back to its birthplace and, if the herd was wiped out, the birthplace pasture "remained vacant for years." Others thought that cows "seek the same place each year to drop their calves." In his book about the buffalo, M. S. Garetson claimed that wild buffalo die rather quickly when their legs are tied, evidently basing a general law on one instance reported by Buffalo Jones, and Jones himself claimed that buffalo never trot but either walk or gallop. Some men said swimming cows carry calves on their backs; some told of a small breed of white buffalo living near Great Bear Lake River, and others believed that the buffalo always stampeded for the nearest timber in a hailstorm, no matter how many miles away the trees grew. There were tales that buffalo stayed close by Indians, but moved out when they smelled white men; that a signal of change of direction could be seen to "pass gradually through the herd" in response to "a moderate bowing . . . of the leader's neck"; that the buffalo hump was a water reservoir.

Buffalo hunters believed that the bulls looked out for the herd—after all, when hunters chased a herd they always

COURTESY OF THE AUTHOR

A. B. Frost made this print in 1885, titling it (with a touch of western humor) "Tête à Tête"; at that time many thought the bison the most dangerous animal in North America.

found the bulls to the rear, protecting, it seemed, with "a gallantry to the fair sex" the cows and calves ahead. Actually, cows outrun bulls. Such biased observers as Buffalo Jones saw devotion in the buffalo "family" that hadn't sense enough to run from a hunter-killed carcass—"a pathetic sight," he wrote, to see a family grieving at the side of a dead mother "until the last one could easily be slain." Some men claimed that bulls protected newborn calves—"the bulls keep scattered round the prairie . . . charge furiously at anything that approaches." Impossible. Bulls, separated from cows during the winter, join cow herds after calves are born. Hunters approaching a herd watched what they called "sentinel bulls," grazing at the edge of the herd. Supposedly they grazed there as sentinels; most likely, however, they grazed there because they preferred to stay away from the cows and their calves.

Some white men attributed the buffalo's final disappearance to the mystical behavior of a superbeast: they were hiding; they'd gone north to Canada en masse; they were "seen" in 1887 swimming the Missouri River near Painted Woods, North Dakota, years after they had disappeared. A man wrote the American Bison Society in 1938 asking for information about the "1872 migration of the American Bison to Canada, where they perished in Baffin Bay region amid the unyielding beauty of snowdrifts and ice flows." He wanted pictures of it!

PERSISTENT FOLKTALES obscure the founding of the Pablo-Allard herd in the Flathead Valley in northwestern Montana. The standard story, which the Department of the Interior repeats in information folders, is the one about a Pend d'Oreille Indian, Walking Coyote, who in 1872 or 1873 brought four bison calves across the mountains to the Flathead Valley after capturing them on the Marias River. Eleven years later, he owned thirteen, ten of which he sold to Michel Pablo and Charles Allard for two hundred and fifty dollars a head.

Folklorish embellishments add color to this story: The sale to Pablo and Allard supposedly took place on the banks of a stream, the cash in neat piles of one hundred dollar bills, each weighted by a stone. Suddenly the two buyers gave chase to a squirrel or mink—"the instinct of the hunter was strong in both"—leaving the money piled in front of the noble savage. When they "realized what they had done," they both ". . . hurried back in consternation to where the money lay, fortunately to find it safe as yet, but with a lone Indian regarding it with covetous eyes."

Embroidery on the story is that a Flathead youth wanted to marry a Blackfoot girl and had to get around the elders of his tribe by bringing some Blackfoot buffalo to the buffalo-poor Flathead country. Thus the gallant brave restored buffalo to his tribe and won his maiden. All of this happened, says

AMON CARTER MUSEUM PICTURES

"Buffalo Hunting," a series of vignettes drawn in 1884, was more nostalgic than contemporary, for most herds had been virtually exterminated by 1883.

the story, among the Indians over three hundred years ago.

This seems to be a variant of the colorful yarn written by a trader on the Marias River, Charles Aubrey—another Hiawathan tale. In his version, Aubrey suggests to Sam Short Coyote that, to make amends to his Flathead tribesmen and the mission fathers over his bigamous second marriage, now ended, ". . . he rope some buffalo calves now nearly a year old—hobble them and keep them with my milch cows . . . he could then drive them across the mountains by the Cadotte Pass, and give them as a peace offering to the fathers at the mission. He looked at me in surprise and doubt. I then showed him that as there were no buffalo in the Flathead country, I thought the fathers would appreciate the gift. He at once said he would try my plan."

According to Aubrey, within a few weeks Sam had captured seven head of buffalo in the nearby Marias country and had started over the mountains with them: three bulls, head and foot hobbled, and four heifers, loose, herded by Sam and his wife heading west into the sunset.

Other yarns show further discrepancies: old-timer Kootenai Brown, friend of Pablo, wrote that the nucleus herd from "the Sweetgrass Hills" was given to a Roman Catholic priest, and that it was raised at a convent for Indian children, and became "tame enough for the children to play with."

And Enos Michel Conkey, a Flathead, said: "We do not know what you say about this Indian man [Running Coyote] you say brought in some buffalo calves. What we do know is that four calves were brought back with a buffalo hunting party by a fifteen-year-old boy named Hawk Blanket. The calves' mothers had been killed and he did not like to see them left to starve or be killed by wolves. This boy's step-dad, Sam Wells, Broken Leg, did not want to be bothered with the two little bull calves and two heifer calves. The Flathead party he was with was hunting in what we know now as the Helena Country." Conkey also said that by the time the party got to Missoula, Wells had claimed the calves and raised buffalo until he had fifty head, which he sold to Pablo-Allard.

Directly opposed to all of this hearsay is the straightforward narrative of Helen Howard, who credited Peter Ronan, U.S. Indian Agent for the Flatheads, with starting the Flat-

Myth had it that "sentinel bulls" grazed at the edge of the herd, showing "gallantry to the fair sex" by protecting the cows and calves.

head buffalo herd. And an examination of Ronan's reports reveals that in 1878 he suggested to the Indians that they drive some buffalo over the mountains. He stated that they drove two cows and a bull from near Fort Shaw through Cadotte Pass, and that the three buffalo had increased to twenty-seven and were owned by two cattlemen. He also stated that he had proposed that the United States buy the herd and propagate buffalo to feed the reservation. This authentic report from a man of undoubted integrity seems a logical explanation of how a nucleus herd reached the Flathead Indians.

I would suggest several sources of the Pablo herd: Ronan probably saw the possibility of propagating buffalo on the Flathead and organized the first expedition, for the notion seems foreign to Indian nature. Once Walking Coyote (or whoever) had accomplished the trailing over the mountains, other Indians may have fetched animals from the prairies at other times. Some of these buffalo eventually belonged to the St. Ingatius Mission; others, to various Indian families. Some were eventually eaten; others sold to Pablo.

But the Ronan report should scotch the myth of Walking Coyote, the noble redman, bringer of buffalo to the Flathead —except that scotching a buffalo myth is like attempting to predict which way the beast is going to turn. It can't be done.

MYTH TELLERS YARNED about the all-destroying buffalo stampede, which in fact seems never to have trampled anyone or destroyed any wagon train—though "their great humps that rolled at one like millions of iron hoops, bounding in the air at every little obstacle encountered" scared a man, or the stench and "the rolling motion of the herd" nauseated him. Stampede yarns told by professional western adventurers—the Buffalo Bills, the Buffalo Jacks, and Buffalo Joneses—wrote of the stampede as "this moment when the heart fluttered at the roots . . . the living cataract . . . woe unto any and all living creatures that chanced to be in its pathway. . . . To flee from their wrath would have been the height of folly." But those who actually stood in front of the

Continued on page 62

DISCOVERY IN THE GRASSLAND

A few years ago my wife and I discovered a meadow. It was not unlike others we had walked through many times before. I knew a little about meadows already because I had grown up on the fringe of town. As a child, I loved to explore. I hiked a lot and learned something about the out-of-doors. I began collecting insects when I was seven, raised caterpillars, and watched the activities of pond life in an aquarium I kept by my window. About meadows, I learned at least that they were busy, beautiful places and that I felt just plain good being there. This much I knew from when I was young, when impressions meant a great deal.

This particular meadow was different only because we ourselves were finally receptive. It could have been any meadow anywhere, or a forest, a pond, or the seashore. The first walk we took was memorable because it was a new beginning, the first in a long series of discoveries, as important to us as the first object an infant crawls to under his own power. The place could have been any place, but the time could not have been any other time.

For us, that first day was the beginning of a new exploration in the land of the small. It was a stretching of the senses and the spirit more than the limbs that we experienced, a rediscovery of a simple, primitive awareness, and the surprise, the thrill, the joy of it shall never be forgotten.

The old, gnarled oaks are like islands in a vast sea of grass. Lichens hang from their limbs, caterpillars chew their leaves, gall insects infest their twigs, birds nest among their branches, all as dependent upon the oaks as ocean birds are upon islands in the sea.

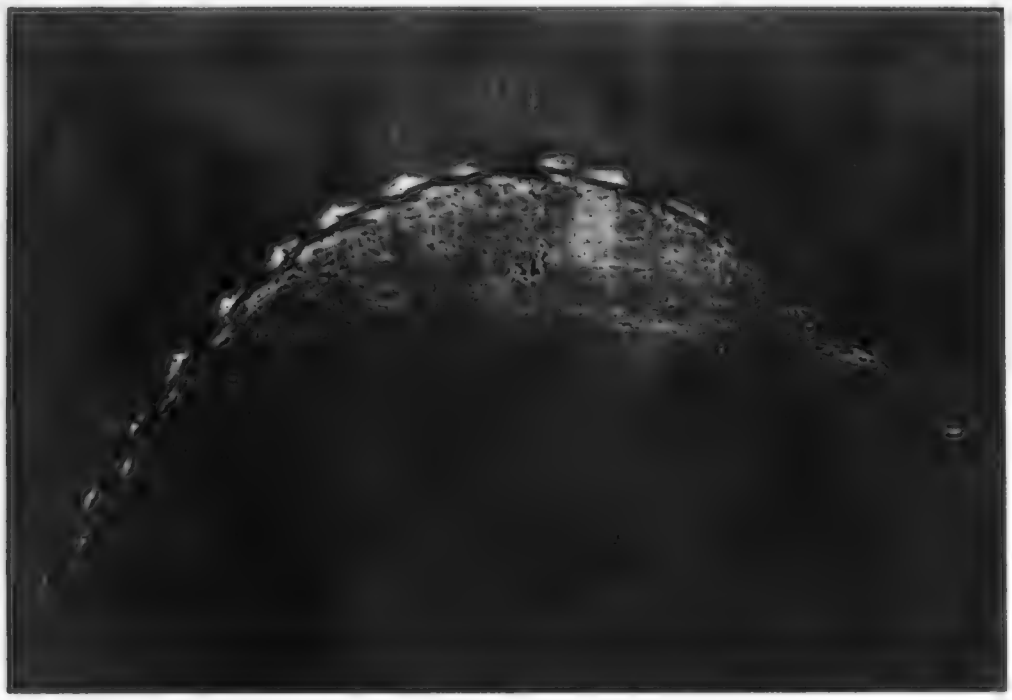
Behind the hooting of an owl, the smell of damp earth,
behind even the buzz of a mosquito,
lie the thrill and excitement of discovery.

Words and Photographs
by David Cavagnaro

Week by week, as spring advanced, the ranks of flowers changed. Soon, California poppies were blooming, replacing buttercup gold with brilliant orange.

Before, we had seen poppies only as fields of color; now we saw them as individual blossoms, and as partners in age-old insect alliances.

In a simple spider web covered with dew we began to see a galaxy of celestial spheres. Besides the shape of planets and protozoans, the size of insects and whales, the behavior of mice and termites, the structure of lungs and honeycombs, how many facets of the universe have been affected by the same laws of physics and mathematics which control the properties of spheres?



We began to sort out the roles each organism plays in the web of life. The plant-eaters were everywhere—caterpillars, katydids, grasshoppers, and crane flies, whose larvae feed among the roots of grass.

When the scorpion fly first emerges, it is soft and tender. As it hangs from the grasses and its wings and exoskeleton harden in the sun, it is difficult to believe that this delicate creature is one of the fiercest predators of the grassland.

Photography is a tool that sharpens awareness and increases one's perception of the significant. It offers a means of selection and interpretation. In short, photography helps one learn to see, but what is even more important, taking pictures puts one out in the midst of things where experiences are direct and firsthand.

The photographic process itself is one of discovery from beginning to end. Seeing the negative just out of the developer or a box of slides just back from processing imparts its own feeling of adventure.

I have found in teaching nature photography that no two people see things alike. When fifteen or twenty of us photograph for a day in the same meadow and later share our results, we are always astonished to discover in the pictures as many interesting and diverse styles of expression as there are people in the class. Yet the kind of equipment used seems to contribute to these differences only in minor ways.

My photographs, like anyone else's, represent my own personal interpretation of the natural world. They are as true to the substance and spirit of each recorded moment as I know how to make them, but they are no substitute for the real thing. They cannot replace the feeling of lying in wet grass, the sensation of numbness on a frosty morning, the smell of the first rain on dry grass, the call of the owl, the croak of the frog, the exhilaration and the joy that accompanied the photographic excursions. To have the full experience, you must go there yourself and crawl through the grass. And you don't need a camera—your mind is the best tool you have.

EDITOR'S NOTE—This article has been excerpted from the forthcoming book *This Living Earth* by David Cavagnaro, to be published in the fall of this year by American West Publishing Company. David Cavagnaro is a naturalist, prize-winning photographer, and author of the widely acclaimed *Living Water* (American West, 1971). He and his wife are resident biologists at the Audubon Canyon Ranch, Marin County, California.

Photographic Details

PAGE 19: Valley oak, *Quercus lobata,* in a winter morning ground fog, near El Verano, Sonoma County, California. Micro-Nikkor; Kodachrome X.

PAGE 20: Flower-visiting *Nitidulidae,* or sap beetle of the genus *Amartus,* feeding on pollen; and the larvae of a small moth, eating petals within a California poppy blossom in the San Geronimo Valley, Marin County. Micro-Nikkor, probably with a small tube; Kodachrome.

PAGE 21: California poppies, *Eschscholzia californica,* from Stinson Beach, Marin County. 135mm Soligor with extension tubes; Kodachrome X.

PAGES 22–23: Distant and close views of the same seed stalk of rye grass draped with a dew-covered sheet-web. San Geronimo Valley, Marin County. Micro-Nikkor, with M-ring for close-up; Ektachrome.

PAGES 24–25: Stages in the emergence of the adult scorpion fly, *Bittacus.* Newly emerged (page 24, top), drying its wings (page 24, bottom), both from Middle Bar, Mokelumne River; and feeding on a crane fly (page 25), near Ione, Amador County. Micro-Nikkor; Kodachrome X.

PAGE 26: Dew-covered dry grasses, San Geronimo Valley, Marin County. Micro-Nikkor; Kodachrome.

Nothing in the universe exists alone. Every drop of water, every human being, all creatures in the web of life and all ideas in the web of knowledge are part of an immense, evolving, dynamic whole as old, and as young, as the universe itself. To learn this is to discover the meaning of joy.

COLOR PHOTOGRAPHS BY LEO TOUCHET

THE INVISIBLE

New Treasures from Man's Ancient Past Uncovered in Alyeska, "The Great Land"

This, he knew, was the perfect camp. He knew it as a feeling deep inside; a feeling one need not put into words. The others knew it too, as they watched him stop and put down his pack. He gazed slowly over the flat, mossy plain with the thick grove of dwarf willows beyond. The grass would be fine for food and medicine, the trees perfect for concealment. On his left, the massive base of the giant mountain began its upward slope; its sweeping size holding back some of the winds, its height offering a craggy lookout. On his right, an icy stream, wide and clear, whispered past, convenient for cooking and laden with plump grayling. Best of all, here at his feet, the marks of the caribou. Just a few now, he knew, for it was early, but this was the main trail and there would soon be more.

He looked at the others and nodded. It was agreed. This was the perfect camp. They began to spread apart, in small groups, marking out their new homes.

A dig by the Atigun River on Alaska's North Slope. Helicopter brings supplies and equipment.

Beneath Guard Mountain on the Atigun, pipeline workers camp where ancient hunters once resided.

CITIES

By Robert Hawkins

THAT WAS eight thousand years ago. Today, in exactly the same spot, practically nothing has changed from that moment. And yet in this desolate canyon in the endless expanse of northern Alaska, another group of men is resolutely prying from the earth one of mankind's earliest secrets: the story of man's first entry into North America.

The participants are university archaeologists, literally hand-picked from all over the United States, and brought to the flat Arctic wilderness to take part in what has become the largest and most extensive archaeological survey and recovery expedition in the history of the Western Hemisphere. What they are unearthing may also turn out to be the most important scientific discovery of the decade: the first solid evidence that the original human inhabitants of North and South America migrated from Asia, crossing over a giant 1,800-mile land bridge that once spanned the two continents. That bridge site is now known as the Bering Strait.

The presence of these rugged young scientists on the far reaches of the North Slope came about as a result of a dig for a treasure of another kind several thousand feet deeper, a treasure that was being formed even as man's earliest ancestors were first passing overhead. That prize was petroleum, and when sizable deposits of it were discovered on Alaska's North Slope in 1968, a mammoth pipeline was planned to bring the oil to market.

Beginning at barren, featureless Prudhoe Bay, on the shores of the Arctic Ocean, it would run through the rugged and largely unexplored interior of Alaska to the port of Valdez, an ice-free, deep-water harbor on the southern coast.

During the initial planning, the Federal Antiquities Act– a 1906 statute providing that any construction project crossing government land must insure investigation and protection of all archaeological, paleontological, or historical sites – was discussed and acknowledged to be one of the most important aspects of the project. It was a law almost uniformly ignored in the past, according to scientific advisors, in both private and government construction projects. Unconcerned or careless construction crews had simply ground their machines over potentially valuable sites, and looting and vandalism had been fairly common. Now there was an opportunity to show how a project of this immensity and importance should properly be done.

But it offered more than that. The scientific world had long held the theory of the Bering Strait migration, but it had never been proved. Now, it appeared there was a more than a good chance that the almost-eight-hundred-mile route of the proposed pipeline, crossing the face of Alaska, might follow what had been the early migration trail. Perhaps archaeological traces of these early cultures could be found, even ancient habitations. The possibilities beckoned.

In late 1969, Alyeska Pipeline Service Company, the consortium of firms formed to design, construct, operate, and maintain the line, contracted with the University of Alaska to take charge of the entire archaeological project. Named to

Arrowheads, knife shafts, and a curved sewing needle surround an adz handle made from a caribou leg.

Harpoon points, rocks used as scrapers, and a fishing net gauge are among the ten thousand finds.

Archaeologists comb the tundra for Eskimo relics, left behind fifteen thousand years ago.

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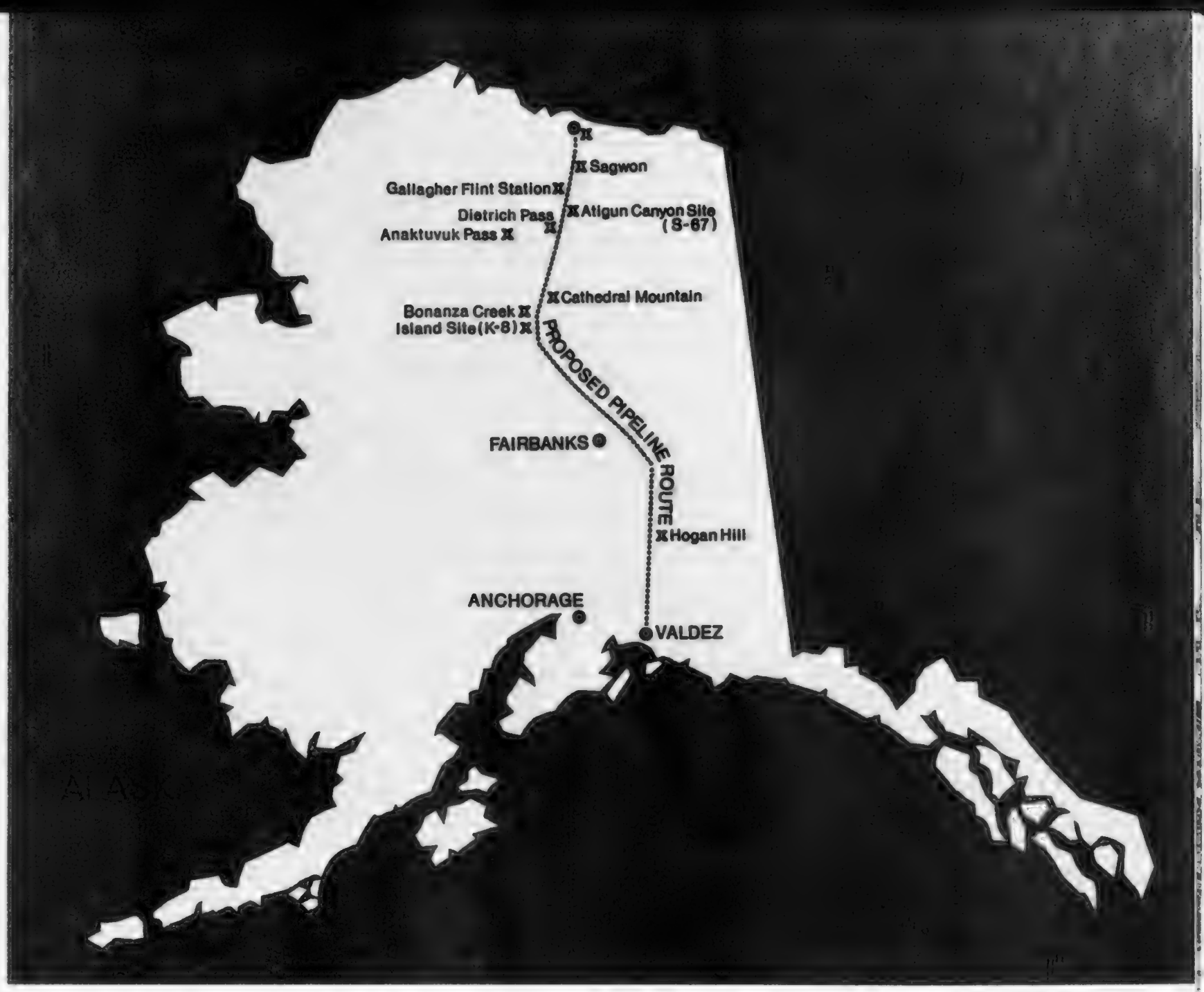


COURTESY OF THE AUTHOR

Archaeological sites outnumber cities along the proposed oil pipeline from Prudhoe Bay to Valdez. The Federal Antiquities Act of 1906 provided for a thorough search along the route before construction began.

lead the program was a rugged-looking, thirty-three-year-old assistant professor of anthropology, Dr. John P. Cook, now chairman of the department. Cook had collected arrowheads, dozens of them, as a child in the cornfields of his Maryland home just outside Washington, D.C. He'd nurtured a nagging interest in archaeology throughout school; then cultivated it, first as an undergraduate at Dartmouth, then with a master's degree at Brown University in Providence and a Ph.D. at the University of Wisconsin.

Now, with an eye on the fast-moving calendar, Cook began to assemble the nucleus of his archaeological crew from among the finest young scientists in the country. From Texas, from Dartmouth, from Washington State University, the group began to assemble at the university's Fairbanks campus.

The red-bearded young professor explained they would only have a short time in the field, three months at best, beginning in June. By the first of September they would be snowed out of business. He didn't know how much they could get done.

Everyone was anxious to try. As Jim Corbin, a twenty-nine-year-old graduate student in archaeology from Washington State, put it, "We didn't know how much time we had, but we wanted to get on with it. For one thing, it was a job for people in archaeology, and in Alaska, that's hard to come by. Secondly, it was a priceless opportunity to get into areas which otherwise we would have been years getting into . . . even getting a look at."

Throughout the last part of the year, and even before all the papers were signed, Cook and his crew were flown up and down the pipeline route. While many archaeologists employ aerial photography in their search for early cultures, these "Cook's Tours," as they became known, were purely for the purpose of getting a fast overall view. Almost immediately,

Tents and excavations (center) are lost in the immensity of the landscape. The Atigun River, a tributary of the Sagavanirktok, is on its way to the Arctic Ocean.

The Atigun River meanders through an ancient canyon into a flood plain beneath the rugged Brooks Range. Along the slope of the canyon, university archaeologists have uncovered evidence of ancient man.

though, three highly promising sites were discovered from altitude, including an important one at Hess Creek. It was clear the project had unparalleled potential.

Finally, all the negotiations were complete. The Bureau of Land Management drew up the stipulations and set up the funding. With the assistance of the Arctic Institute of North America (a newly created government group formed to oversee and consult on the project) and a crew from Alaska Methodist University, the scientists began their unprecedented expedition, to be carried out primarily on foot.

As the days treaded by, the unbelievable immensity of the state grew even more obvious. As low, rolling tundra gave way to dwarf spruce and then to the rippling crags of the Brooks Range, the graduate students began to realize why the state ranks first in national size and fiftieth in population. The expanse is breathtaking. Alaska yawns across four time zones and, superimposed on a map of the Lower Forty-eight, would stretch from Florida to California and from Minnesota to Texas. One of its mountains is the tallest in North America, one of its five thousand glaciers is bigger than the states of Maine and Rhode Island combined, and its seacoast is longer than the Atlantic and Pacific coastlines put together. Although the pipeline corridor is mapped to be 789 miles long, even with its fifty-foot-wide right-of-way, it will still occupy only one one-hundredth of one percent of Alaska's 586,412 square miles. It was a comforting thought for the hikers.

Officially, their assignment was to survey the pipeline route and technically "clear" it of any historic or prehistoric site, but they all knew it was far more important than that.

Dr. Cook explained, "Most of us feel that the first human

BLACK AND WHITE PHOTOGRAPHS COURTESY OF THE AUTHOR

inhabitants on this hemisphere came across the land bridge, as it's called, in a kind of slow migration that probably took many thousands of years. As the polar ice caps grew and then receded again, we know from geologic dating methods that this bridge was open at two different times during the last part of the Pleistocene period, about 50,000 or 60,000 years ago, and again around 20,000 years ago. And it was quite large too, not just a small, narrow trail that they had to trickle across. It actually amounted to another continent a thousand or more miles wide. Theoretically, these early people were hunters, traveling in small bands following after herds of bison, caribou, or mammoth."

During the migration, or expansion, into this new area, Cook explained, the environment was altered, probably several times, which initiated changes in the cultural life and perhaps even in the physical characteristics of the people. "What these changes were or how they came about are important questions whose answers can be applied to the study of mankind everywhere," he concluded.

Even though the scientists had a good idea where the most likely locations would be, investigation still had to be done a mile at a time. The exploring teams worked out of the company's base camps, and were dropped into otherwise inaccessible locations by helicopter every day. Nor did the crews really know what to expect. As Jim Corbin recalled, "Many times the route was going where, you know, if you were out on an archaeological expedition, you'd never even go look because there's not going to be anything there and you know it, but maybe fifteen miles away, you would know for certain would be much better to look."

Nevertheless, some traces of early Eskimo habitation were soon found. While the team from Alaska Methodist University was surveying the extreme southern section of the route, Cook coordinated the efforts of several field parties examining the northern three-fourths of the corridor. Whenever a large campsite was discovered, the men stayed out several days at a time, mapping, photographing, and excavating the dig.

A variety of ancient artifacts was found, depending on the estimated age of the campsite: spear points and small arrowheads, drum handles, and tiny fishing lures and net gauges. During the summer, almost four hundred miles of northern Alaska were surveyed and some 189 sites were found and excavated, each producing a boxload of tangible history to be examined and classified. Cook estimated that without the survey, in this one section alone, ninety distinct sites would have been adversely affected by construction activities and all the remainder probably would have been disturbed.

Outlines in the tundra of ancient Eskimo dwellings adjoin the canvas homes of the scientists.

Danny Hugo (left), an Eskimo from the ancient village of Anaktuvuk Pass, excavates while project leader Jim Corbin (center) and Dr. Herb Alexander discuss the potential of the site.

"It's a great thing for us to be out here," he said with a grin. "This is a tremendous opportunity for us to do field research that otherwise might never be done . . . to get a firsthand closeup look at this part of the country that we've been wondering about for so long." Cook estimated that with the help of the company helicopters they had been able to accomplish in one summer what it would have taken four years or more to do without them.

A few of the sites were found to have been the "small weapons factories" of the Eskimos; tiny camps located in stone quarries where rocks were found that had been used in making arrowheads and spearpoints. Most everything that was found, with few exceptions, supported the nomadic, seasonal, hunting party theory. The majority of the sites were small and apparently occupied for only a short time.

From the fish and bird bones that were found, the researchers knew the early hunters had some subsistence other than caribou, moose, or sheep. The campsite was apparently a man's world, too, for only in two locations farther north was any evidence of woman's presence noted. The one thing all the campsites had in common was location or alignment.

"After you're up here a while," explained Charles Diters, Dartmouth graduate, "you can begin to think like an Eskimo and you can pretty much figure out where you'd most likely

Jim Corbin (left) and Charles Diters are part of a team of twenty scientists excavating Alaska's North Slope. The caribou antlers by the tent are of recent origin.

A hailstorm provides welcome relief from Arctic mosquitos as Jim Corbin takes field notes on the artifact in front of him. The curved white object is a steel tape measure.

want to set up camp. First off"—scratching his short blond beard—"you'd want some sort of a vantage point so you could spot the caribou or the other game coming at you. Then, ideally, you'd be near running water and maybe, if you were lucky, you'd have a few berries nearby or the bark or shoots of the young willows."

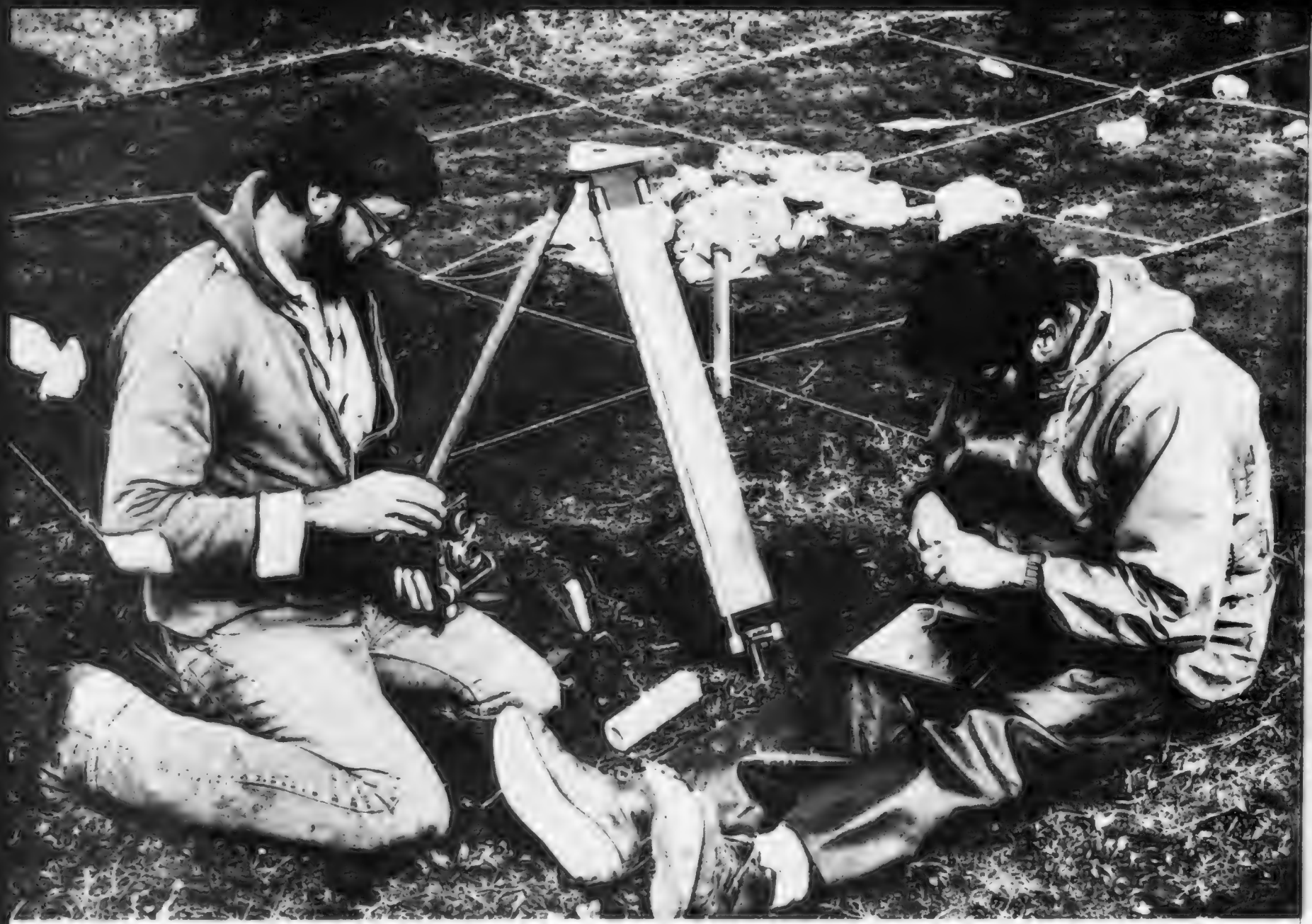
The surveyors also found there was no evidence to substantiate the old theory that the early hunting camps always faced in a southerly direction. Every site located pointed a particular way, either facing a lake, a river, or a forest access, or acting as a lookout, or a combination of these.

"Another old wives' tale," one of the scientists observed, "like the story about the igloos. We always used to learn in school about the Eskimos up in Alaska living in these little round ice igloos. The fact is none of the natives up here had ever heard of one. The first one they ever saw was one that was built for them by some visiting Army engineers."

All the researchers, at one time or another, expressed admiration and some kind of awe at the grandeur of the northern Alaska scenery, particularly the fantastically carved Brooks Mountain Range, probably one of the last great remaining virgin wildernesses—the craggy mountains swooping up to staggering heights, the endless horizon of tundra stretching out in every direction, far past the limits of imagination, and the memorable silence, unbroken except by an occasional falcon cry. Some of the scientists felt, too, a great kinship with the early Eskimo whose past dwellings they were so carefully examining.

"He had to be the most efficient, the most perfectly adapted early man that we've run into so far," Cook ventured, as he poured a mug of hot coffee. "He took practically everything there was at hand and put it to perfect use. He was able to completely work and live with the environment, and that's something that western civilization doesn't do."

Sixteen-year-old Charlie Kemnitz, an Explorer Scout from Anchorage, takes notes as Corbin labels an Eskimo knife-handle at the Galbraith Lake dig.



Near an ancient stone hearth (behind the tripod), Corbin (left) and Doug Regar, both students from Washington State University, prepare to photograph and label freshly unearthed artifacts.

THE SCIENTISTS were taking a lunch break inside one of the low nylon tents to avoid swarms of mosquitoes outside. It was comfortably warm at the site, not the 120 degrees some of the archaeologists had experienced at other Alaskan digs, but somewhere on the hospitable side of seventy. In a little over two months from now, it would be a different story. The temperature would plummet off the deep end of most thermometers, hitting a frigid bottom somewhere around seventy degrees below. The sixty-mile-per-hour winds whipping across the slope's 76,000 square miles at just twenty-three degrees below would create a chill factor equal to 101 below. In this environment, unprotected flesh freezes in less than thirty seconds; men walk backwards into storms lest even their shallowest breathing frost their lungs. Last year, when the slope recorded a record eighty below, an oil worker took off his wool mask to yell at a companion and froze his vocal cords.

On this summer day, the only hazard would be running out of aerosol insecticide, which the men sprayed on generously in an attempt to defeat the clusters of black Arctic mosquitoes. Even so, for the moment, the scientists were at ease. They were well into their second summer now, having excavated almost two hundred historic and prehistoric sites, and had come to feel they were beginning to know the early Eskimo pretty well.

"You talk about efficiency," Jim Corbin remarked, "... the thing that amazes me is how they used every bit of everything . . . nothing went to waste. Take the caribou, for example." The tall, rangy anthropologist began counting off the items. "They'd get a caribou, probably right outside camp, and drag it in, and use the flesh for food for themselves and their dogs. They'd use the intestines, the liver, heart, and even some of the glands. Then, of course, they'd use the hides for clothing, rugs, things like that. The skulls were broken open for the brains and tongue, and long bones were splintered for the marrow. The nose went into a soup,

The photograph Corbin is taking will complete the record of the site. Measured, mapped, and photographed, the artifact is now ready to be airlifted back to the laboratory for further study.

and the other parts that were harder, like the joints and toes, they made another kind of soup out of. They'd skim off the oil to use in their lamps. Then, there were all the things they made out of the antlers. . . ." He shook his head, amazed.

The variety of items the early nomads had conceived from caribou antler did seem almost endless. In addition to what the archaeologists had expected to find such as knife handles, and spear and arrow points, the excavations north of the Yukon had turned up sled parts, parka needles, both straight and curved, dowels, pegs, and even a number of tiny mortised joints.

The age of the camps had surprised some. As John Cook put it, "Almost none of the area's been covered in terms of archaeology. We find sites from fifty years old to 15,000. Every one we uncover just adds a few more pieces to the whole puzzle."

The ancient site Cook mentioned was one of his greatest delights and one of the two archaeologically richest villages located so far. Squatting almost invisibly on the rainless, rolling tundra just south of Prudhoe Bay, where the pipeline right-of-way meets the proposed construction road, the prehistoric village was found. It appeared to have been once a community of some complexity. A number of antler and stone artifacts were turned up, each more or less routine, but among them a young researcher found a delicately ancient, yet precision-made fluted spearpoint chipped out of flint. Dr. Cook has placed its age tentatively at 13,000 years. The official name of that particular archaeological dig on the twisting Sagavanirktok River was immediately changed in honor of the arrowhead's discoverer, to Gallagher Flint Station. It was here that Alyeska (the word means "The Great Land" in the Eskimo language) voluntarily suggested rerouting the pipeline to avoid any possible disturbance of the site.

The process of putting more or less exact dates on bones and stones and other ancient artifacts is much more scientific and accurate than it once was. In addition to the time-tested

With a gardening trowel, Danny Hugo carefully uncovers a spearhead of his ancestors. The archaeological survey, although only scratching the surface of the tundra, has produced more than ten thousand artifacts.

geologic dating methods of superposition of rocks and the study of stratigraphy, or layering of strata, to determine a simple chronology of events, scientists are now harnessing the atom to extract more precise information. Using the atomic dating method, based on the fact that all living matter contains ascertainable amounts of radioactive carbon, archaeologists now are able to establish a realistic time-frame date, in both relative and atomic time, for the origin of an object. After death, decaying matter loses its radioactivity at an exact rate with certain elements decaying more slowly than others. The rate of breakdown, known as the "half life," can be measured to estimate the object's age.

Nothing nearly so sophisticated was needed at site number S-67; just an uncommon amount of logic. S-67 was one of the most beautiful of all the archaeological campsites, poised in the gently rolling tundra of Atigun Canyon at the northern foot of the Brooks Range, one hundred fifty miles inside the Arctic Circle. Most of the crew referred to the camp as Galbraith Lake, which was actually a small body of water two and a half miles west, one of literally thousands of tiny lakes and ponds that speckle the arid Arctic landscape. But S-67's real name, probably its first name, is Aniganigaruk. It had been an ancient Eskimo hunting camp, and the artifacts the small group of men were now carefully extracting from the crusty brown tundra identified the tribe as Nunamiuts.

Project leader Jim Corbin, in charge of the dig, gestured to the activity around him and explained, "It was right about here that the village was located. They came in, probably in early fall, about ten to twelve families, we think, and built seven moss houses. That's what we're digging for today."

Dotting the ground before him, a strange checkerboard of wooden stakes and barricades of string, marking off with scientific precision the exact dimensions of a forgotten Eskimo subdivision. The top two inches of tundra, that ubiquitous mixture of moss, lichens, and wildflowers, had been peeled back and laid aside, revealing a dry, chocolate mass of decayed vegetation about the texture of shredded wheat.

A lone archaeologist kneeled at the edge of a meter-square

A sampling of Eskimo technology: Arrowheads made of chert, jade, and obsidian. Archaeologists found these artifacts strewn along the eight hundred miles from the north coast to the south coast of Alaska.

block, patiently scraping the ground with the edge of a small garden trowel. To his left, like a small boy playing surgeon, he had arranged the other tools of excavation: a large hunting knife, several dental picks, tweezers, and a pair of two-inch camel's hair brushes. Off to one side was a cardboard carton filled with small paper bags, each labeled and filled with tundra treasure.

Several other graduate students occupied nearby grids, some mapping and writing laboratory notes on the location of their finds, others with Polaroid and regular cameras, photographing their items in every stage of removal.

Corbin pushed up his black-rimmed glasses and pointed to a rough circle of white rocks located roughly in the center of one "house" of string.

"That's kind of a quick way we've found of locating where the moss houses used to stand," he said; "the tents, too, for that matter," explaining that one of the first things the hunting party would do was set up a fire. Then they would build their habitation around it. In the summer, they would live in caribou hide tents, taking them from camp to camp. When winter came, they would build a house of moss. In either event, all that remained today was a simple rock hearth, sometimes round, sometimes rectangular. Not really an unusual structure, but definitely not one that occurred naturally in the wilderness. "Besides, when you find three or four more or less together, it kind of hints at the presence of man."

The moss or sod houses, made from a combination of available materials, were surprisingly efficient. Beginning with a framework of willow poles, they were covered with a wrapping of caribou hides and then sodded with a heavy layer of ground moss for insulation. Inside, the floor consisted of more light branches covered over with a thickness of caribou and moose hides. The fire in the center of the structure provided a place for warming and cooking. Because it was considered unlucky to use a house for more than one season, usually a fresh house would be built for each hunting excursion. Eventually, abandoned and forgotten, the old ones would crumble and decay.

The ancient Eskimo hunting arsenal included this spearhead and lance point (center). They were fashioned from blanks like those shown at the left and right of the picture.

"We're actually standing on the roof now," Corbin explained, pointing at the squares with his penknife. "After we locate the boundaries of the house and start to dig, this is what we come upon first, and it's only about two inches below the surface. When the houses finally collapsed, that was the last thing that fell, so that's what we hit first. Then, we'll come across some wall braces and supports, and mixed up somewhere in all of that, the walls themselves. That's sometimes the part that's really interesting," he admitted.

Like their modern counterparts, early hunters often would hang cooking utensils, clothing, even weapons on the walls. Sometimes they're still there, among the debris.

Most common among the artifacts found at Aniganigaruk were "those little blue beads," with which the hunters liked to decorate their parkas, Corbin supposed. Perhaps, during the long day when the hunters were away, this was one of the chores of the women in camp. The presence of the beads, unusual but definite in the ancient site, had been verified with the discovery of crude white buttons, thimbles, and several Ulus, a so-called woman's knife, with a flat, curved blade.

The most surprising artifacts found, according to Corbin, indicated the use of guns. A good scattering of percussion cap boxes was unearthed, lead balls, reworked cartridges, a side plate from a cap and ball rifle, and a butt plate from a Hudson's Bay trade gun—all good indications of meetings with other cultures, perhaps through early traders. Finally, there was the matter of the tent rings, those simple rims of rocks placed in a circle to hold down the edges of a tent. Once, long ago, there had been quite a collection of tents here, as well as moss houses; almost a dozen, in fact. But the rings at S-67 were found not to be round, like those in really early camps, but square or rectangular. Before contact with the outside world, the scientist related, the Eskimos' tents were always circular or oval—dome shaped, formed with

An Ulu, or woman's knife (left), with a handle of caribou antler and a crescent-shaped blade of stone. In recent times, iron crescents have been used. The other tools are hand blades and scrapers.

willow branches, covered with twenty or more skins, but circular. But after seeing modern canvas tents, usually square ones, the natives' tents would begin to take on this civilized configuration.

Then, Galbraith Lake (or Aniganigaruk) wasn't an ancient camp . . . a prehistoric camp? No, but it was a *historic* camp, and consequently this one village could well be the most important site uncovered so far. True, there were some villages nearby, across the river, that were perhaps two thousand years old, but this campsite, although younger, was far more valuable.

"I've got it pretty much pinned down," Corbin said. "It couldn't have been any earlier than 1873. Probably between 1880 and 1890."

How could these young researchers pinpoint the date so closely of an all but invisible village?

"By the cartridges," Corbin explained. "There are books, like catalogs, that tell when certain cartridges and particular guns were first issued and came on the market. One of the cartridges we found wasn't manufactured and issued to the public until 1873, so we know the village was in use about that time.

"But here's what makes it important. This is the first village that we've found where we can make a discovery, form a conclusion or make a statement, and then actually check on our accuracy. You see, this village is so 'modern,' in archaeological terms, that there are actually people still living who either visited here, or knew other people who did. People living over at Anaktuvuk Pass right now, some of them were here as children."

He gestured broadly over the land.

"So here we have a prehistoric Eskimo culture using stone-age methods, technologies, and Eskimo culture that existed right into modern times. We can dig, and make out conclu-

Eskimo hunters once warmed themselves around this cluster of rocks. The stones formed the fireplace of an Eskimo hut of sod and spruce. When the scientists leave, they will put the carpet-like tundra back in place.

sions, and then go over to the village of Anaktuvuk and get with some of the Eskimo elders there and double check our findings. If we've come up with the wrong answer or are going down the wrong trail, they'll set us straight. It's a perfect way of getting the greatest accuracy possible."

Another reference, even closer at hand, was one of Corbin's own field assistants. Danny Hugo, a quiet, thoughtful young Eskimo, whose family had lived at Anaktuvuk for generations, had been asked to join the dig by one of the scientists at the beginning of summer. Hugo, whose Eskimo name is "Putu," was a great help and valuable source of information to the anthropologists. Unlike the Indians of Alaska, the Eskimo people and Danny himself had no religious or ethnic compunctions against excavating the past lands of their nation. On the contrary, that his grandfather had once lived in a moss house somewhere in this very area gave the project a particular closeness and interest for him.

NOW THAT MORE THAN two summers of exploration are over, the longest—in miles—single archaeological dig across the face of a continent is concluded, but only partially. The excavation, which so far has cost Alyeska Pipeline over $380,000, has yielded a wealth of artifacts, over ten thousand of them, now being painstakingly cleaned, classified, and catalogued by Jim Corbin at WSU, and at the University of Alaska. Eventually, they will be part of a public display, perhaps even at Prudhoe Bay, to show the complex cultures and technologies that abounded in the Arctic. In the meantime, a great deal has been learned.

This expedition has finally and completely linked the Alaskan Eskimo with proven antiquity. It has provided hundreds of new facts in scores of unexplored areas concerning the early tribes' food, clothing, shelter, tools, weapons, habits, and route. A large and key piece of the giant jigsaw puzzle that is Man has been filled in.

Perhaps the theory of Arctic migration will never be completely proven. To date, no one single item has been unearthed that in itself substantiates the trek of the ancient hunters, but scientists universally are satisfied "this is the only way they could have gotten there." When the information derived from this new eight-hundred-mile Alaskan survey is added to the archaeologists' past knowledge, the evidence begins to mount up.

The scientists' accurate dating of the "land bridge" openings, discovery of a number of tiny "microblade" tools in Alaska, almost identical to artifacts found in eastern Asia and upper Japan, and evidence of Eskimo life four thousand

Dr. John Cook, chairman of the University of Alaska's anthropology department, classifies the result of the dig in his Fairbanks office. His reconnaissance flights at the beginning of the project were dubbed "Cook's Tours."

years ago as far south as Bettles are all helping to substantiate archaeology's early theory of man's progression down through the continent. By studying and analyzing the materials found, researchers are learning how and why the ancient cultures changed and the approximate dates when they made contact with other molding or formative groups and cultures.

And the inundation may have been even further reaching, geographically, than previously realized. The "Paleo-men" or early men migrating into Alaska not only were the ancestors of all North and South American Indians, but may themselves have wandered as far south as Peru. Recent discoveries there show man's presence on the highlands twenty-two thousand years ago.

The project has had some less obvious benefits, according to director John Cook, in providing invaluable training and experience for a number of Arctic archaeologists. "At least five M.A. theses and one Ph.D. dissertation will deal with these sites and the problems they represent. That's remarkable in itself," he declared.

And it isn't over yet. When the pipeline gets under way, the archaeological teams will be on the spot, backtracking with the crews the entire 789 miles of the route. As construction begins, the scientists will scrutinize every foot of excavation, whether it be for pipeline, road, or pumping station. If the deeper digging uncovers anything "interesting," Cook and his men are authorized to stop the work and remove the items or request that the line be detoured.

The long walk, acknowledged as the largest scientific operation of its kind in North America, was an important landmark of another kind as well. Dartmouth archaeologist Elmer Harp, who helped supervise the dig for the federal government, says it "could well be the best organized expedition of all time."

To John P. Cook, it represents "a very real precedent in northern archaeology. When a commercial organization can show the concern to effect a program of this magnitude, an imposing pattern is set for future projects and developments, no matter what their origin."

Learning how past men in various parts of the world have adapted to changing environments, how technologies have been invented, and accepted or rejected, can tell us a great deal about ourselves. Archaeology in Alaska may turn out to be one of the most lasting treasures of "the Great Land."

Robert Hawkins, *formerly a writer of radio and television documentaries, is now a freelance writer and photographer and a frequent contributor of articles to national magazines in the areas of history and environment.*

A Matter of Opinion

Will Progress Destroy Our Ancient Treasures?

These are days when it is difficult to equate progress with technology, culture with affluence, and scientific achievement with over-population. Nuclear power provides the potential for a better world, but it also represents the awesome power to destroy the earth. The superhighway makes it possible for us to live more comfortably in the suburbs, but these vast ribbons of concrete also become arteries for hordes of automobiles spewing sickness into the environment. The shopping center provides convenience, but this same complex defaces the land and may bury forever our links to the past.

Included in this issue of THE AMERICAN WEST is "The Invisible Cities," an article concerning the archaeological treasures being unearthed in Alaska, along the route of the controversial proposed pipeline that would tap the oil resources of the Far North. Great, priceless, irreplaceable discoveries—key links, perhaps, to the riddle of man's entrance to the North American continent—are being revealed for the first time. It would appear, in this particular case, that we are making progress without equating it with destruction, and this would be a rare exception.

We started the process of destroying archaeological treasures in America about the time we landed at Plymouth Rock and the pilgrims robbed an Indian grave in order to get some corn. That regrettable act was hardly justified, even though the pilgrims needed the corn and didn't recognize the value of aboriginal artifacts.

Since World War II, in spite of an awareness, the ruthless destruction of mementoes of our ancient heritage has been increasing in geometric proportions. Land leveling has swept across the hill and mountainside from sea to shining sea. Giant, man-made lakes, so necessary to provide water and recreation for an exploding population, have meant first bulldozing the land and then burying it under fathoms of water. Housing developments, shopping centers, freeways, and runways are preceded by a leveling of the land (and often knolls are exactly where archaeological finds exist), and ultimately covering it with concrete or with acres of homes, self-service laundries, and supermarkets.

The importance of these treasures is pointed out by archaeologist Hester A. Davis: "The only sources of adequate information on 20,000 years or more of human occupation of the New World . . . lie buried in the ground. . . . When found in their original context, artifacts, remains of houses, fire hearths, storage pits, burials of human beings, and even man's trash and garbage can be used to interpret the way of life of a particular group of people at a particular time and in a particular place. Any disturbance of the original context of these materials destroys the only clues that the archaeologist has for interpreting these ways of life."

Specific examples of what is happening emphasize how tragic the situation is. Near Florissant, Colorado, some of the most important fossil beds in America barely escaped the bulldozer's blade when, following a court-restraining order and a long court battle, Congress eventually stepped in and preserved the site as a national monument. Near the northern Great Lakes resort development threatened complete obliteration of one of the vital archaeological areas of the country; how much was destroyed before salvage operations started is unknown. According to Hawaiian archaeologists, as many as 65 percent of known sites on the island of Oahu, Hawaii, have been destroyed to make way for urban and agricultural development.

Add to this mass destruction in the name of progress the damage caused by the rapidly growing hordes of amateur collectors, treasure hunters, vandals, and professional scavengers. "Confining ourselves strictly to the field of historic preservation, we must place at the top of the list of destroyers the artifact hunter," says a report issued by the New Mexico State Planning Office. "Armed with detectors, trowels, picks, shovels, whiskbrooms, and even backhoes, these unrestrained agents of destruction have riddled scores of New Mexico sites, ranging from early man hunting camps to nineteenth-century ghost towns."

Fortunately, some steps are being taken to protect these treasures, however inadequate they might be. As noted in Mr. Hawkins' article, there is a cooperative effort between the government, the archaeologists, and the pipeline company to salvage this important site. There are on the books some laws designed to protect the heritage of the past, and various archaeological associations have been formed to lobby on behalf of preservation of these relics.

But time is rapidly running out. In the end it is the public and the politicians, more than the giant corporations and the bulldozer operators, who must seek an effective way to save these few fragile links to man's ancestral past.

D.E.B.

A MATTER OF OPINION *is provided as an open forum. Contributions from our readers are invited, but should be limited to 750 words and must be signed.*

Why Wallace Stegner Won the Pulitzer Prize with a Work of Historical Fiction

MOST WRITERS, be they hopeful beginners or sweating professionals, gaze up at the dizzying summit of the Pulitzer and wonder how the few who have reached it managed to get there. Wallace Stegner, recently awarded the Pulitzer Prize in fiction for *Angle of Repose*, stands high on that peak today, and it may be that his writings in THE AMERICAN WEST and our experience with him cast some light on the means by which such heights are scaled.

When *Angle of Repose* was published, we reviewed it in our May 1971 issue with this editorial note: "THE AMERICAN WEST rarely reviews works of fiction, primarily because ours is a magazine of history. However, there comes a time when it appears expedient to break with tradition, and with this issue we are exercising that prerogative."

". . . fiction . . . history." Those are the key words that have been bouncing around academic halls for a century, casting hollow echoes. Those are the words Stegner picked up, turned over, and examined in his article "On the Writing of History"* in this magazine in 1965. Those are the words he blended with such superb craftsmanship that he has now gained the Pulitzer summit. Words? They are more than mere words. They are ideas, concepts, gut beliefs. In Stegner, they are solid and well-formed by years of careful thought. He knew his ground and stood it well in that article seven years ago when he challenged the old argument that dramatic narrative corrodes true history. Without sound reasons for this heretical stand, he could not have written *Angle of Repose*.

His thoughts and arguments on this subject bear repeated consideration by students and writers of history. He began the article with: "It is my impression that too many trained professionals consider narrative history, history rendered as story, to be something faintly disreputable, the proper playground of lady novelists."

With that gauntlet down, he launched his argument favoring dramatic narrative: "It is not the presence of dramatic narrative that makes false history false. Falseness derives from inadequate or inaccurate information, faulty research, neglected resources, bias, bad judgment, misleading implication, and these afflict the expository among us about as often as they afflict the narrative.

"It is true that the excitement of storytelling, like the excitement of phrasemaking, often tempts a writer into misrepresentation. But the excitement of analysis, the excitement of generalization, can do the same: and the laudable lust for absolute accuracy can lead to dullness, can cause a man to proffer a set of notes instead of a finished book, as if one did not write history, but collected it."

He then took a good look at both sides of the controversy: "Any method has its dangers. The solution is not to repudiate both generalization and dramatization, both the accurate and the vivid, and sit inert in the middle of one's virtue. Neither is anything gained by pretending that all narrative historians write better than expository historians, for clearly some narrative historians write badly and many expository historians write extremely well. Speaking as an amateur, I should guess that the trick is to make the twin cutting tools of sound research and a sense of the dramatic work together like scissor blades."

Stegner's work habits also require the twin tools of hard thought and hard work. As everyone in the publishing business knows, too many "Forewords" and "Introductions" are quickly whipped out by "big names" for a quick buck and extra publicity. Not so with Stegner. When he promised to write the introduction to our book *Great Western Short Stories*, he faced the time problem of feeling that he must read one or two of the thirty stories in the proposed book he had not read and reread four or five he hadn't read for some years. He became so deeply involved that he recommended we add certain important stories which had not been planned and delete a few which he felt were not good enough. Only then did he write and polish his introduction—a major statement on history, myth, and the western writer. Late last year, when we asked him to write a foreword for our new book about the correspondence between Frederic Remington and Owen Wister, he took on the project with the same enthusiasm and thoroughness.

That, then, is at least a glimpse into the way this Pulitzer Prize winner thinks and works.

As for Stegner's book itself, most of the reviews we have seen have missed the real point of *Angle of Repose*—the daring and almost impossible task that Stegner set for himself, the genius with which he handled it.

This book is not about the West; it is about *people* who *happened to be* in the West. More than that, it is a comparison of the lives, mores, morals of three people spanning one hundred years—the grandmother who went west in 1876, the grandson who is attempting to re-create her in 1970, and the flippant "immoral" young girl who has her ideas as she helps him with research and typing. Few writers would dare to tackle such a difficult theme; fewer still could accomplish it so well.

We who love western history are fortunate that Stegner, in creating these three challenging characters, also probed a deeper understanding of the West itself and drew word pictures that surpass the works of many of the artists and photographers who were there. It seems to us that Stegner's solid thinking and painstaking craftsmanship—along with his talent—were vital parts of the equipment with which he scaled the Pulitzer peak.

George Pfeiffer III, *Publisher*
THE AMERICAN WEST

*Reprints of this important article are available for readers upon request while the supply lasts.

North America Divided

REVIEWED BY WARREN A. BECK

North America Divided: The Mexican War, 1846–1848 by Seymour V. Connor and Odie B. Faulk *(Oxford University, New York, 1971; 300 pp., maps, biblio., index, $7.95).*

THE REACTION AGAINST the Vietnam involvement has given war a bad name. Historians are presently competing with each other to rewrite the history of past conflicts showing America in the worst possible light. Of all of this country's past wars, there has been more nonsense written about the Mexican War than any other. It has been traditional to claim that the conflict was a result of American imperialism against an innocent, weaker neighbor, or as a plot of that Machiavellian despot, James K. Polk, "to get more pens to crowd with slaves."

A recent study claimed that the American president deliberately engineered war to compensate for his psychological failings! Public figures from Lincoln to Robert F. Kennedy have referred to the Mexican War as "the most disgraceful episode" in the American past. It is, therefore, refreshing to review a book that sets the record straight at a time when too many historians are more interested in writing propaganda than working as objective servants of Clio.

The authors have produced the best up-to-date single volume on the Mexican War. Ninety pages of annotated bibliography include all types of source material, including the basic primary and secondary works in Spanish. The book is at its best when analyzing the causes of the war. The important role of the Federalist-Centralist quarrel in Mexico and the part it played in creating dissatisfaction in Texas and California is properly treated. The boundary controversy as a cause of war is dismissed, as "no official of any Mexican government has advocated publicly or officially that the Nueces be accepted as the boundary (and no evidence has been found that any did so privately)."

The impossibility of settling private American claims because of domestic anarchy and the procrastination of Mexican officials is stressed. It is pointed out that many Mexican officials believed that their army, which was four times that of the United States, was vastly superior in quality, that a war would be one of offense against the northern republic, and that Mexico was impregnable behind its deserts and mountain defenses.

It was popularly believed south of the border that political division in the United States would retard prosecution of the war and that British aid was assured as a result of the Oregon controversy. Instead of indicting the American president as a warmonger he is lauded: "Polk seems to have had an exceptional sense of responsibility and obligation."

Some would quarrel with the division of the book: for example, there is a chapter on the campaigns in New Mexico and Chihuahua and one on the struggle for California, while there is only a single chapter on Taylor's fighting in the north and one on Scott's epic difficulties from Vera Cruz to Mexico City. The fear that Britain was preparing to seize California is over-stressed; recent scholarship has dismissed the threat as more illusory than real.

The authors frequently refer to the Irish Catholics of the San Patricio Battalion. The truth is that this group of American Army deserters was neither as Irish nor as Catholic as has been generally thought. It is also an over-simplification to state: "One of Scott's first orders was to execute members of the Batallón de San Patricio who were among the Mexican captives." There was first a court martial and not all deserters captured were executed.

Perhaps the chief failing of this effort to compress so much into so few pages is the lack of maps. There are only three, and these are very general. The omission of detailed maps of the battles detracts from an otherwise valuable work.

Warren A. Beck, *professor of history at California State College, Fullerton, is author of* A History of New Mexico *and co-author of* An Historical Atlas of New Mexico, *the forthcoming* History of California *(Doubleday), and* An Historical Atlas of California.

Harmsen's Western Americana by Dorothy Harmsen *(Northland Press, Flagstaff, 1971; 213 pp., illus., biblio., $35.00).*

REVIEWED BY DON RUSSELL

A COLLECTION OF one hundred western paintings with biographical profiles of the artists—all paintings excellently reproduced in color—makes this book both useful and beautiful. Bill and Dorothy Harmsen started their collecting only a decade or so ago. They missed Bodmer, Catlin, Remington, Schreyvogel, and a few others, but even so, it would not be easy to put together another hundred of like importance. They seem to have been looking for those who painted Indians, and this gives the book a degree of unity.

Many artists of the present day are included, contradicting the legend that artists are never recognized until they are dead. Also included are some of the first to depict the Indian and the West—Charles Bird King, Alfred Miller, John Mix Stanley, Charles Wimar, and Albert Bierstadt, for example. The explorers include William H. Jackson and Thomas Moran. Few eminent chiefs missed having their portraits painted by either H. H. Cross or E. A. Burbank. The Custer-fight painters, Edgar S. Paxson and Richard Lorenz, are here. The notable illustrators include William de la Montagne Cary, Charles M. Russell, Harvey Dunn, and N. C. Wyeth. The Taos group is generously represented.

A word about the pictures: If you are reading by electric bulb, the colors may appear heavily dark, but a brighter light will bring out blues and reds as sharp as even J. K. Ralston can make them, which is to say that reproductions, as well as oils, require proper lighting.

The one-page profiles tell much about the artists, pulling no punches, but occasionally more about their work would be appreciated. Marchand illustrated novels by Cyrus Townsend Brady and Augustus Thomas's *Arizona,* but the Reverend Mr. Brady did not write the play. To call Sir William Drummond Stewart "a caravan leader for the American Fur Company" somewhat misses the point in his employing Miller. And was it for Armour that Walter Ufer did tomato can labels?

Don Russell *is author of* The Wild West *and* Custer's Last, *and compiler of* Custer's List *(of Custer battle art), all published by the Amon Carter Museum of Western Art.*

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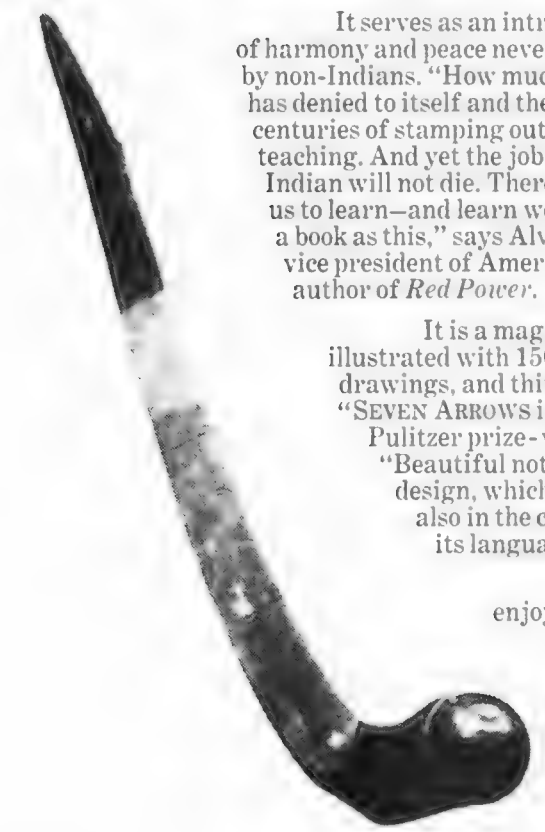

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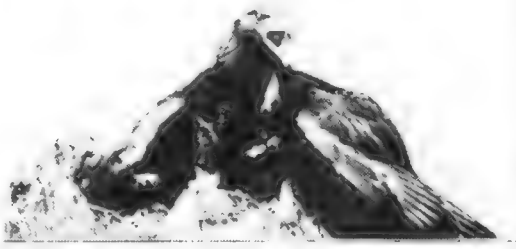

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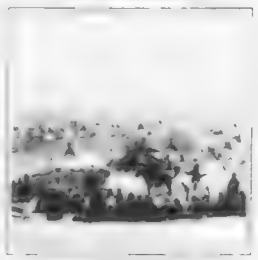

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How the U. S. Cavalry Saved Our National Parks

REVIEWED BY DOUGLAS H. STRONG

THIS BOOK is a study of the early years of national park management, before the creation of the National Park Service, when parks were administered by the United States Army. The author's thesis is two-fold: first, that the United States Cavalry, while stationed in the parks, was instrumental in preserving them and also in keeping alive the movement that led to the creation of the national park system; second, that policies of these military administrators were the basis for the policies of the National Park Service after 1916.

How the U. S. Cavalry Saved Our National Parks by H. Duane Hampton *(Indiana University, Bloomington, 1971; 246 pp., illus., biblio., notes, index, $8.95).*

The two short introductory chapters deal with the genesis of the idea of national parks in the United States and the establishment of Yellowstone in 1872. In the next five chapters, which make up well over half the book, Hampton gives a detailed and fascinating account of the administration of Yellowstone between 1872 and 1918. Then, following a single chapter on the three California national parks—Yosemite, Sequoia, and General Grant, which were also under military administration for a time—he concludes the book with an explanation of why military administration was terminated in the parks and an assessment of its contribution to their history.

For the first fourteen years of its existence, Yellowstone was administered by civilians. Among the most serious difficulties they faced were the lack of adequate legal machinery with which to enforce park regulations and, until 1878, the lack of any appropriations.

In 1886, when Congress, critical of park management, failed to appropriate funds to pay the civilian guards, the secretary of interior requested that the secretary of war send cavalry troops to patrol the park. This was intended as a temporary expedient; it was not until thirty-two years later that these troops were withdrawn. It is Hampton's contention that during these years, the military administration "did, in a very real sense, save the Yellowstone Park from physical and legislative destruction."

The military "acting superintendents" in Yellowstone withstood political threats to dismember the park and to commercialize it for the benefit of private interests. They took a personal interest in preserving the park's wildlife and aesthetic qualities, even resorting to extra legal means to enforce the rules. Trespassing sheepherders, for example, were evicted across one boundary while their sheep were scattered across the boundary on the opposite side of the park. The attendant losses to the sheepherders effectively discouraged them from entering illegally into a national park guarded by the military.

Hampton is at his best when he describes the intriguing political maneuvering and practical problem-solving that went on in the early days at Yellowstone. He is less successful in substantiating his supposition that the military administration "might" very well have saved Yellowstone from "a failure that would probably have brought an end to the incipient movement toward a national park system."

While he leaves no doubt that the military made a valuable contribution to Yellowstone, it seems unlikely that without the military the park would have been abandoned at the very time when national concern for conservation was increasing rapidly. It seems even less likely —considering the growing sentiment in favor of preserving the wilderness, setting aside recreation areas, and protecting points of historic and geologic interest— that a failure here would have ended the movement for a national park system.

Hampton's study is based on extensive research in archival records, including personal correspondence which he uses judiciously to enliven his story. The book is well written and a welcome addition to the growing body of historical literature on the national parks.

Douglas H. Strong *is professor of history at San Diego State College and author of* The Conservationists *and* Trees—or Timber? The Story of Sequoia and Kings Canyon National Parks.

Who Owns America?

REVIEWED BY GEORGE M. PLATT

FOR THE MOST PART this book is political history, and as such it is probably of most interest to students of politics. It deals with ex-Secretary of Interior Hickel's version of exciting times—his role in the 1968 and 1970 campaigns, his confirmation fight, his opposition to Vice President Agnew's speeches, his concern for the unrest of youth, his now famous 1970 letter to President Nixon, and his dismissal from office. Considerable space is also devoted to his ideas on relationships between our economic and political systems. As such, the book contributes to the record of the Nixon administration, and in other journals it will be evaluated in that context.

Who Owns America? by Walter J. Hickel *(Prentice-Hall, New Jersey, 1971; 329 pp., $6.95).*

The purpose here, however, is to review the book in terms of the question asked in the title: *Who Owns America?* Mr. Hickel's answer, established through brief vignettes of public events during his tenure—offshore oil, Hell's Canyon, condors, the Everglades, the Alaska pipeline, blue whales—plus scattered, brief statements concerning his method for handling environmental problems, comes through loud and clear: The people own America.

But his conception of the *people's ownership* is that of nineteenth-century populism. Everyone owns a piece of America, just as stockholders own a corporation; the government is the board of directors, the president heads the firm, and the secretary of the interior is the managing director who must operate with the rugged individualism of the frontier. The author's solutions to environmental problems take their cues, not from a conceptual framework related to the variables of today's complex society, but from the personal vision of a leader who personally institutes action.

This philosophy, of course, leaves average citizens—the *owners* of America—without the protection of an established national policy and at the mercy of individuals. Consider, for example, his frustration over the problem of mine safety: "I was frankly unable to fight my way through the maze of conflicting facts and opinions to get at the clean, honest story. I never had a good 'gut' feeling about it, something I consider extremely important." One is not surprised, therefore, when he concludes that a people's party should emerge every four years to offer an alternative candidate for president. Such a party would free the president to act in the best interest of the stockholders, for "if the president cannot be free, who owns America?"

Mr. Hickel's philosophy is grounded in the importance of individual land ownership, spawned perhaps by the disappointments of the tenant farm life of his Kansas boyhood. He cannot conceive that anyone would choose to live in a city: "The urban problem has as its central core the fact that people need to live with reasonable access to their work but still crave the open spaces of country living."

Hickel's environmental control concept is reminiscent of that of Gifford Pinchot, and if nothing else, *Who Owns America?* leads one to reread Pinchot's *Breaking New Ground*. Although Pinchot may have instituted a new and needed concept of resource ownership and use at the turn of the century, and even though he may have been personally able to control—until he too antagonized a president—the destiny of the physical America, Pinchot's philosophy of elitism seems to leave something to be desired fifty years later.

It would be easy in many respects to be a Hickel fan. He is concerned about important things—water and air pollution, Indian lands, the musk ox—and he fought the good fight. But he lost, perhaps as he argues, because he would not compromise his principles; yet he might have lost because he failed to realize, as this reviewer believes, that bureaucratic problems require bureaucratic solutions and that the reliance upon individualism, no matter how right the individual might be, merely opens the door to control by the interest groups that are so abhorred by populists.

George M. Platt *is associate professor of political science at Wichita State University.*

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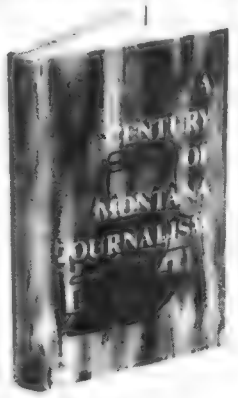

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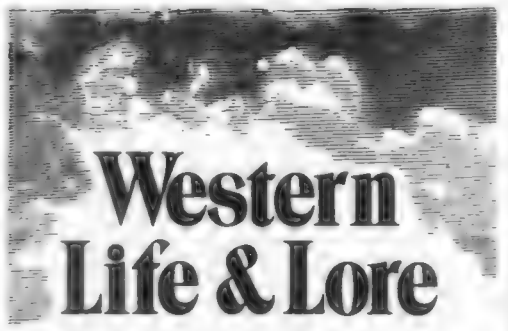

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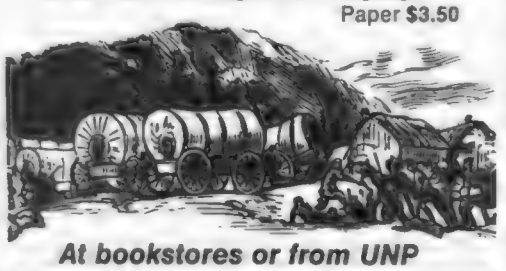

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Spanish Texas: Yesterday and Today by Gerald Ashford *(Pemberton Press, Austin, 1971; 296 pp., intro., illus., biblio., index, $7.50).*

REVIEWED BY DAVID M. VIGNESS

THE STORY OF Spanish Texas continues to enjoy popularity among historians and other writers. Covering a period of three centuries, it includes the adventures of Spaniards who crossed Texas's vast prairies and plains, sailed along her coastline, worked to civilize her friendly Indians, jousted with her more bellicose ones, and fashioned the institutional life necessary to administer that vast, sparsely-settled region of her empire in New Spain. Once it was established that Texas had little natural wealth—as resources were identified in those pre-industrial days—only priests with varying degrees of zeal for evangelizing Indians and royal officials for balancing defenses against pressures from French, English, Anglo-American frontiersmen from the East, and hostile Indians from the West kept alive the interest in the region.

It is appropriate that a newspaperman —a fine-arts editor—synthesize in felicitous phrases the story once again. With a flair Gerald Ashford has taken standard primary and secondary sources and recreated the drama and excitement of long marches and disastrous Indian raids; the isolation and boredom of existence in forests of the East and on dusty prairies along the Rio Grande; and the challenges and disappointments of missionary life.

What makes this work different and enhances its value is the context of the telling. These are days when minority groups seek formal recognition of contributions their ancestors have made to the history of the nation. In an essay which serves to introduce the book, Mr. Ashford has consciously developed the influence he sees of the Spaniards in the Southwest. His title indicates his intent. He suggests many aspects of life—from the more easily recognizable architecture to the more subtle matters of intellectual outlook—in which the influence of the Spaniards and later the Mexicans is still observable.

The last two chapters ("Texas' Heritage of Spanish Law" and "Spanish Law in the Republic and State") contain much information which is instructive to the general reader. Spaniards, living for the most part in semiarid and arid regions in their homeland and on the northern shores of Africa, had developed and from other cultures had adapted concepts of land and water rights suited to their dry environment. When the Anglo-Americans entered the American Southwest, they brought with them English land and water laws, laws developed where water was plentiful. Thus the Spanish legal approach to the matter of water ownership and control was more realistic to the environment than that of the English, and Texas water laws in the republic and in the state reflected their Spanish background.

This is a handsome book. It is artistically designed and manufactured. The bibliography, while not extensive, is meaningful. My first impression was that the print could have been larger, but the engrossing narrative soon carried me beyond that cavil. To reverse a frequently-made remark, this is a book from which the professional will learn and one which the general reader will find refreshing, entertaining, and rewarding.

David M. Vigness *is chairman of the department of history, Texas Tech University.*

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Quarterdecks and Spanish Grants by C. Raymond Clar *(Glenwood Publishers, Felton, California, 1971; 159 pp., intro., illus., biblio., index, chronology, $10.50).*

REVIEWED BY BENJAMIN F. GILBERT

IN THIS ELEGANT BOOK the author has written a meritorious and entertaining biography of his paternal grandfather, John Clar. The protagonist participated in the premature occupation of Monterey by Commodore Thomas Catesby Jones in 1842, serving as interpreter of the landing party and secretary of state of its short-lived military government. Although he was a Spanish citizen (until 1855), Clar had already served nine years in the United States Navy and was professor of mathematics aboard the *Cyane*, assigned to the Pacific Squadron. In 1832, shortly after graduating from Spain's Royal Naval Academy, Clar had boarded the frigate *Constellation* in his native Minorca, signing on as schoolmaster.

Clar had first visited Monterey in 1836, when attached to the *Peacock* during its eastward sailing around the world. From 1841 to 1845 he often engaged in naval operations off California until he became ill and was granted sick leave. When he recovered in 1847 and his request for active duty was refused, he resigned in anger. He then engaged in railroad construction engineering in New England before returning to California in 1849 as master of the barque *Humboldt*, which carried gold seekers from Panama.

From the time he was hired as a technical clerk by the Land Claims Commission in 1851 until his death in 1884, Clar was usually employed by different federal and state agencies as either a land surveyor, a Spanish translator, or an archivist of the land office. During the early fifties he was involved in efforts to acquire the Encinal at Oakland from Vicente Peralta, as were others such as Henry Carpentier and William Heath Davis, and he was elected surveyor of Marin County. In 1857 he acquired a land claim at Geyserville, originally known as Clarville, where he operated a ranch for a brief time. From 1859 to 1863 he resided in Santa Barbara, being elected county superintendent of schools and then appointed justice of peace.

Clar was a California pioneer of considerable importance whose name did not even appear in Hubert Howe Bancroft's *California Pioneer Register*. California historians neglected him except for Theodore H. Hittell, who relied upon Clar's statements of 1884 for his account of the 1842 Monterey seizure. The author, through careful and widespread research, has objectively portrayed here his grandfather's deserved role. Although there are a few minor errors in fact and in the spelling of names, the book is scholarly, soundly interpretative, and most readable. There is also a fine two-page "appreciation" of Don Juan Josef Clar by Dr. George P. Hammond of Berkeley.

Benjamin F. Gilbert, *professor of history at San Jose State College, teaches California and Iberian history and is author of numerous books and articles on California and maritime developments.*

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Anza Conquers the Desert by Richard F. Pourade *(Union-Tribune Publishing, San Diego, 1971; 216 pp., illus., maps, index, $12.50).*

REVIEWED BY FEROL EGAN

THE EXPLORATION and settlement in the American West took men of strong will and purpose. All the conditions were right for the care and training of epic heroes, and even a casual glimpse at the history of the West gives readers such names as Jedediah Smith, Jim Bridger, John C. Frémont, and John Wesley Powell—all men who stood above the rank and file. Yet, one of the greatest figures of all remains almost unknown to most Americans. That man was Juan Bautista de Anza of Sonora, Mexico. Now, in a condensation of Herbert Eugene Bolton's monumental *Anza's California Expenditions*, Richard F. Pourade reintroduces the great trailblazer and leader of early California pioneers to new generations of readers.

To picture the story of Anza's search for an overland route from northwestern Mexico to California, Pourade has included contemporary photographs of the country through which Anza and his colonists traveled. Also, there is a good selection of maps to guide the novice. But it is in the photographs that one sees the hard traveling that Anza and his followers had to endure: the Pinacate Craters where volcanic glass slashed the hooves of horses and mules; the confusing twists and turns of the Colorado River's delta channels; the broken stones and fossilized oyster shells of the Yuha Desert; the dry, barren land below Calexico; and the snow-covered floor of the Cahuilla Valley.

These illustrations help bring the Anza expeditions of 1774–76 alive and complement this incredible tale of the hardships faced by men, women, and children who journeyed seventeen hundred miles in a year and a half from Culicán, Sinaloa, and Horcasitas, Sonora, to San Francisco Bay. Theirs was a journey across some of the worst desert country in the world, a hike and a ride by horseback and muleback into history. But history was not their purpose. The 242 persons who arrived with Anza accomplished the impossible only because they were bound for a Land of Promise.

Pourade has done an admirable job of selecting the right passages from Bolton's work to give all the facts of Anza's expeditions. The country is described mile by weary mile. The Indians encountered are clearly pictured, and the role of the padres and soldiers is made clear. Yet, the one thing that is missing is the sense of drama that these expeditions had, the feelings of the people, and most of all, a rounded view of Juan Bautista de Anza—a most remarkable man for any season. Everything is present in *Anza Conquers the Desert* except the most vital ingredients: a sense of humanity, a feeling of reality to fill out the costumes, the backdrops for an epic drama.

Ferol Egan, *an associate editor of* THE AMERICAN WEST, *is author of* The El Dorado Trail *and the forthcoming* Sand in a Whirlwind: The Paiute War of 1860.

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The Gunfighters by Dale T. Schoenberger *(Caxton Printers, Caldwell, Idaho, 1971; 207 pp., intro., illus., biblio., notes, index, $12.95).*

REVIEWED BY GARY L. ROBERTS

TODAY, when violence has become a respectable and important theme in American history, J. Frank Dobie's observation that the frontier cannot be understood unless its violence is recognized seems appropriate to the discussion of this new volume about the gunfighter. No figure has been more associated with western violence than this misbegotten product of the urban frontier. Yet while the gunfighter is one of the West's most overwritten subjects, in all the vast literature only a few volumes have lasting value, and no single work has ever provided a "definitive" view of the gunman.

Dale T. Schoenberger's new book, *The Gunfighters*, is not definitive either, but it is an interesting volume that reflects the current dilemma of writing in this field. Hero worship and debunkery have tended to focus attention on the limited objective of establishing "facts" about the lives of the gunmen and to minimize larger themes of interest to the historical community. Schoenberger's book follows this tradition in the hope that it will "result in the most accurate and definitive analysis of these particular men." To accomplish his purpose, the author examines the lives of seven of the best-known gunfighters — Allison, Earp, Hickok, Masterson, Short, Holliday, and Thompson. Each biography attempts "to tell the stories of the famous western gunfighters as their contemporaries saw them." The author relies heavily upon court records, newspapers, and recollections to fashion his accounts. All of this sounds familiar, but there is merit to such an approach because "getting the facts straight" has been bungled so badly in the past.

Schoenberger is careful. He provides extensive notes, most often to primary materials. Indeed, he is so obsessed with primary sources that he tends to ignore secondary studies in his notes even when it is obvious that he has used items not cited. The author has exploited a variety of little-used materials and provides useful new information. He has made especially good use of the federal records. Moreover, Schoenberger makes an admirable effort to be objective and fair. He tries gallantly to stick to the simple, straightforward recitation of the facts. Sometimes his facts are debatable, but even if they were not, the portraits drawn are essentially lifeless because he tries so desperately to avoid judgments that might prove controversial.

As a result, insights into the characters of his subjects are sparse. Style and readability suffer in the process, but Schoenberger sticks to his method.

It is an appealing argument, implying pristine objectivity, but it is basically naive. In the first place, rumor and legend do creep in—and not always in the framework the author allows himself. Moreover, he is rarely critical of primary sources, sometimes seeming to equate original sources with truth. He seems to have made little effort to understand the biases of contemporary sources. He also has the annoying tendency of misstating the opinions of other writers, although granted that in some of these instances Schoenberger's opinions are as plausible as others.

His premise underestimates the importance of understanding the legend in order to get at that illusive "truth." Legend is a dimension of the historical problem, and it cannot be shoved aside without abrogating the responsibility of the historian. Even Schoenberger has an interpretative framework that belies his claim to "the facts, ma'am, nothing but the facts."

E. H. Carr observed years ago that "To praise a historian for his accuracy is like praising an architect for using well-seasoned timber or properly mixed concrete in his building. It is a necessary condition of his work, but not his essential function." In the end, whether Schoenberger succeeds in his effort to understand the gunfighter depends upon what a reader expects from such a work. If one searches for a parade of facts and succinct chronology free of the blatant partisanship of earlier efforts, *The Gunfighters* will be applauded. But if one agrees with Carr, he is likely to be disappointed.

Gary L. Roberts *is professor of history at Abraham Baldwin College, Tifton, Georgia.*

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Nightfall at Nauvoo by Samuel W. Taylor *(Macmillan Co., New York, 1971; 403 pp., biblio., index, epilogue, chron., $8.95).*

REVIEWED BY WILLIAM P. MACKINNON

SAMUEL W. TAYLOR, in *Nightfall at Nauvoo*, has undertaken two interrelated tasks: a description of the birth, the spectacular expansion, and the abandonment of Nauvoo, the Mormon Mississippi River community in Hancock County, Illinois, during the period 1839–46; and an examination of how this experience relates to the violent collisions between the Latter-Day Saints and non-Mormon groups both before and after the Nauvoo period.

With respect to the latter, Taylor's premise is that "The Mormon story concerning persecution of a blameless people must be re-examined . . . we must accept as a basic concept that both the Mormons and the Gentiles were, by and large, good people, and that each side of the conflict was sincerely motivated."

The principal landmarks in the Nauvoo story have all been covered before, as indicated by the entries in Taylor's substantial bibliography. As important as Taylor's explanation of the abandonment of Nauvoo as either internal dissension or the accelerating fear and envy of Nauvoo's neighbors, is the persistent refusal of the Mormons to effectively clean their own house. Taylor argues that, in effect, Nauvoo became infested with an "underworld" element that joined the Mormon church for protection and then used the city as a sanctuary from which to conduct counterfeiting operations as well as hijacking expeditions into Missouri.

When first accusations and then proof arose with respect to the Missouri thefts, the Latter-Day Saints chose to ignore rather than to investigate them, a display of solidarity that further aggravated the intolerance already rife in the border areas of Missouri, while at the same time seriously undermining the sympathetic image of Mormons as persecuted refugees originally held by most of Illinois during the period 1839–40.

In addition to the substance of his material, some mention should be made of Taylor's style or approach to it. At the beginning of his bibliography (which is, of course, at the end of the book) Taylor places the reader on notice that he has examined Nauvoo as a "writer" rather than as a "historian." Lest there be any doubt that Taylor considers the latter to be some lower form of animal life, constipated with the baggage of index cards and footnotes, he adds the gratuitous observation that "A writer lives by ideas, while a historian isn't allowed to have one—he can never make a statement, but must find someone who said it first."

In a related disclosure, Taylor assures the reader three times within the initial two pages of the bibliography that ". . . I would not be bothered by nit-picking detail if essential truth were preserved."

The question arises, then, as to the nature of the work that Taylor's ideas and search for essential truth have produced. In brief, *Nightfall at Nauvoo* treats the Mormon experience in Illinois as a scenario, larded with unsupported quotations and conversations couched in a breezy, colloquial style that suggests a carry-over from Taylor's earlier work as a screenwriter on Walt Disney's film, *The Absent-Minded Professor*. Anyone familiar with the allegations of Porter Rockwell's countless acts of church-inspired brutality and murder will shudder to hear Taylor characterize Rockwell, Babbitt-like, as not "much of a mixer," while later describing a woman whom Rockwell stole from her husband without benefit of divorce proceedings as an "attractive cupcake."

At the risk of undertaking to nit-pick, it also should be noted that those of Taylor's readers receiving their introduction to Mormon history via *Nightfall at Nauvoo* may well be puzzled by his unamplified use of such terms as "Gentile" (non-Mormon, not non-Jew) and "cohort" (a Biblical military designation adopted by the Nauvoo Legion), if not completely misled by his ludicrous supposition that Smith's Legion commission as a lieutenant general might, in the event of war, place him ". . . in command of his country's armed forces."

Taylor's failure to connect or explain Lee and Mountain Meadows in any meaningful way leaves the uninitiated groping for help while at the same time foreclosing a natural avenue for examining federal-Mormon relations in the 1850s and the use of the Nauvoo Legion.

Finally, again with respect to Taylor's perspective, it should be noted that although he blames the Latter-Day Saints for many of their own problems, his treatment of them throughout the descriptions of Nauvoo is fair, sympathetic, and respectful. This position appears to be substantially at variance with the strong criticisms of LDS scholarship and church censorship permeating Taylor's bibliographical notes, a conflict that becomes even less clear with the Kirkus Service's notation that Taylor is ". . . a descendant of a leading Mormon clan." Macmillan Company might well have added a brief reference to Taylor's church affiliation, if any, to the dust jacket blurb.

On balance, having backpacked a copy of *Nightfall at Nauvoo* together with fifty pounds of necessities through the Maine wilderness, this reviewer recommends Taylor's book only as a supplement to but not a replacement for such standard, well written volumes as Robert B. Flanders's *Nauvoo: Kingdom on the Mississippi* and Fawn M. Brodie's *No Man Knows My History: The Life of Joseph Smith.*

William P. MacKinnon *of Port Chester, New York, has performed extensive research on Utah and the Mormons and has written for the* Utah Historical Quarterly.

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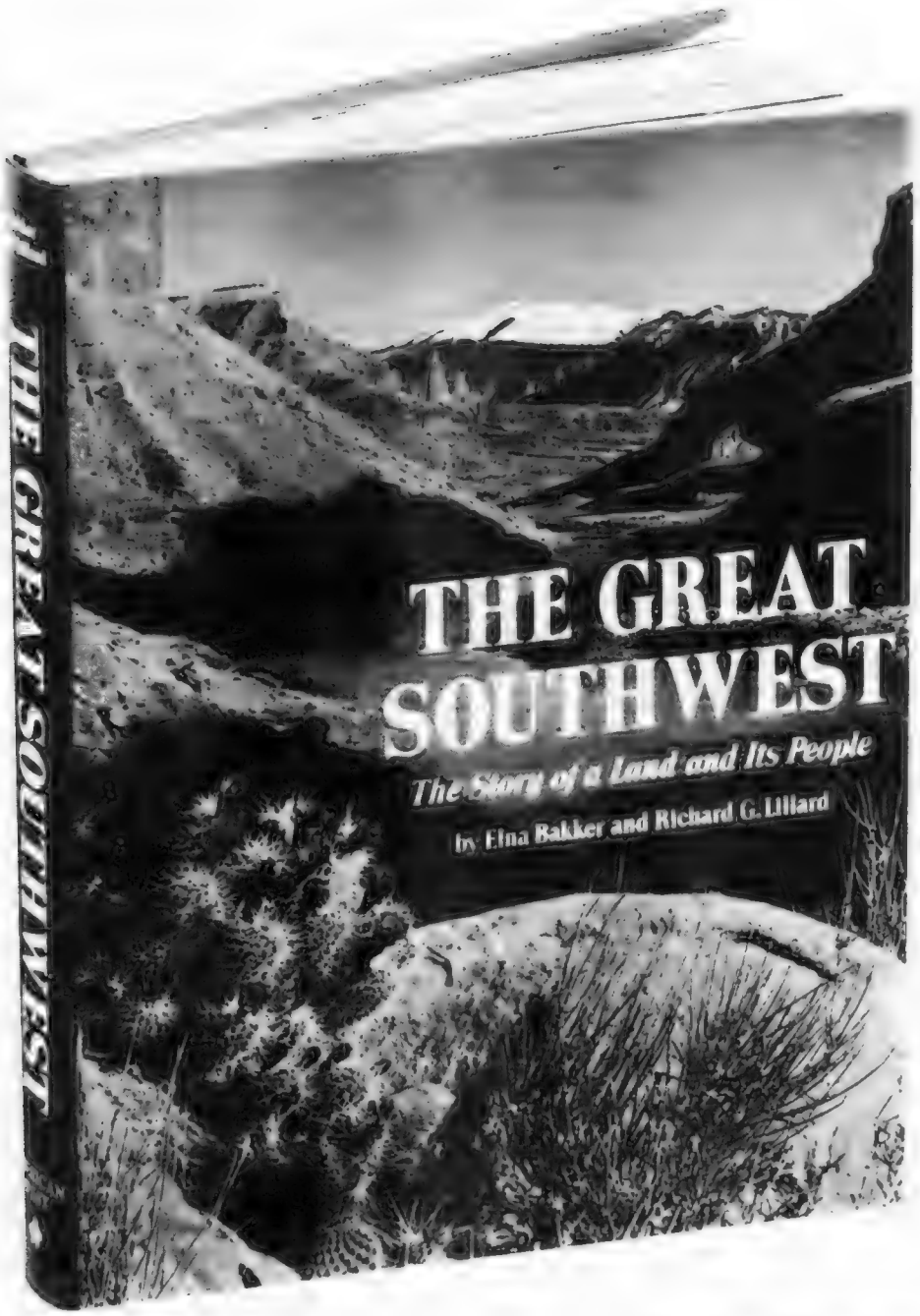

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The Black Military Experience in the American West edited by John M. Carroll *(Liveright Publishing, New York, 1971; 591 pp., illus., biblio., notes, index, $17.50).*

REVIEWED BY WILLIAM H. LECKIE

THE GROWING INTEREST and appreciation of Americans from all walks of life in the contributions of black Americans to the history of the United States will be enhanced by this book. Skillfully organized and edited by John M. Carroll, this volume documents the role of the black from the time of Spanish discovery and exploration to the Mexican troubles of 1916–18.

Within the fifty-eight articles grouped in ten sections of the book, the emphasis centers on the characteristics and exploits of four regiments of these black troops—the Ninth and Tenth cavalries and the Twenty-fourth and Twenty-fifth infantries—who campaigned in the West for a generation. Led by white officers, these units compiled a notable record that until recently has been largely ignored.

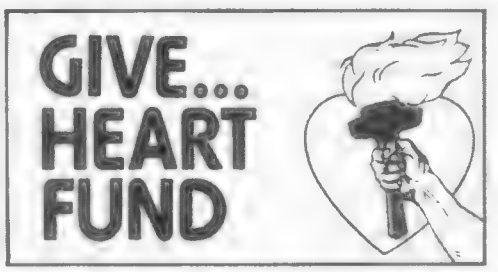
Organized between 1866 and 1869, these regiments were sent west as quickly as the ranks could be filled. They fought, bled, and died from the mountains and deserts of northern Mexico to the Badlands of the Dakotas. All the hostile tribes of the Great Plains as well as the Apaches and the Utes tested the mettle of these troops and respectfully dubbed them "buffalo soldiers."

Their performance in the Red River War of 1874–75, the Victorio War of 1879–80, and in the Ghost Dance outbreak of the Sioux in 1889–90 could only be described as outstanding. These black men in blue encountered enemies other than warring redmen—Mexican revolutionaries, border outlaws, thieves and other threats to peace and settlement—but they did their duty in the best traditions of military service. The only obstacles they did not meet and overcome were prejudice and discrimination.

Most of the articles in this book are not new to scholars in the field, but Carroll has rendered a definite service in bringing them together under one cover. The general reader will find *The Black Experience* both enlightening and entertaining. The book is richly illustrated with more than sixty reproductions of the work of such artists of the Old West as Frederic Remington, Charles Russell, Nick Eggenhofer, Jose Cisneros, Stanley Long, and others.

Carroll has also compiled an illustrative companion volume to *The Black Experience*, entitled *Buffalo Soldiers West*, published in 1971 by Old Army Press. This collection of original drawings includes all of those which appeared in *The Black Experience* as well as many which did not make it into the book due to space specifications.

William H. Leckie *is vice president for academic affairs and professor of history at the University of Toledo.*



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The St. Louis–San Francisco Transcontinental Railroad: The Thirty-fifth Parallel Project, 1853–1890 by H. Craig Miner *(University Press of Kansas, Lawrence, 1972; 236 pp., illus., maps, notes, biblio., index, $8.50).*

The author reconstructs from newspapers, government documents, diaries, and previously untapped corporate records, the fascinating story of the nature of this enormous enterprise and the character of the men who controlled it.

1001 Questions Answered About the Oceans and Oceanography by Robert W. Taber and Howard W. Dubach *(Dodd, Mead, and Co., New York, 1972; 269 pp., illus., biblio., index, $7.50).*

Concise answers are given on almost every conceivable phase of oceanography, including those relating to ecology, pollution, chemistry, geology, biology, tides, food, and myths.

Wily Women of the West by Grace Ernestine Ray *(Naylor, San Antonio, 1972; 158 pp., illus., biblio., index, $5.95).*

Some eighteen fascinating females are presented in a vivid, well-researched discussion of legendary women. Among those mentioned are Calamity Jane, Cattle Kate, and Lola Montez.

Out of Old Rock by J. Frank Dobie *(Little, Brown, and Co., Boston, 1972; 237 pp., $6.95).*

Bertha Dobie, the late author's widow, compiled these sketches of sixteen "old rock" individuals—genuine, independent, and unpretentious. A cowboy preacher, wildcatter, trail driver, gunman, ornithologist, and homesteader are among those profiled.

The American Indian: The First Victim edited by Jay David *(William Morrow, New York, 1972; 192 pp., intro., $6.95).*

An anthology of twenty-six narratives, poems, stories, and essays. All but three are written by Indians, who discuss their way of life before and after their encounter with the white man.

Iowa on the Eve of the Civil War: A Decade of Frontier Politics by Morton M. Rosenberg *(University of Oklahoma, Norman, 1972; 262 pp., preface, biblio., index, $8.95).*

Political cross-currents precipitating the Civil War are viewed from the perspective of the first free state admitted to the Union from the trans-Mississippi West. Iowans' reactions in this period to such issues as immigration, nativism, and slavery shaped not only the destiny of the Hawk-Eye State but of the Union as a whole.

Daring Donald McKay or The Last War Trail of the Modocs edited with introduction and notes by Keith and Donna Clark *(Oregon Historical Society, Portland, 1971; 118 pp., illus., notes, $2.95 paper).*

This facsimile reproduction of the 1884 edition tells of the adventures of the three-quarter Indian Donald McKay, the Warm Springs' Indian scout, in the milieu of the life and times of the Pacific Northwest and nineteenth-century America. An example of regional writing, illustrated with woodcuts, engravings, and photos of the Oregon Historical Society.

Alaskan Eskimo Life in the 1890s as Sketched by Native Artists by George E. Phebus, Jr. *(Smithsonian Institution, Washington, D.C., 1972; 168 pp., illus., biblio., notes, $15.00).*

The author evaluates life scenes uncovered in 1967 not so much on their artistic quality as on their historic and documentary importance. The sketches in pencil, ink, crayon, and watercolor were executed by young adults in public and private mission schools.

Only A Miner: Studies in Recorded Coal-Mining Songs by Archie Green *(University of Illinois, Urbana, 1972; 504 pp., illus., biblio., index, $12.50).*

An unusual study of folk songs as reflections of life changes wrought by industrialization, urbanization, and mass media technology. Many of the illustrations are published for the first time.

Wea Creek to El Dorado: Oil in Kansas, 1860–1920 by Francis W. Schruben *(University of Missouri, Columbia, 1972; 176 pp., illus., biblio., index, $8.00).*

The narrative traces the early expansion and recession periods of the Kansas petroleum industry, along with man's response to the possibility of affluence. Special attention is given to the state's battle with Standard Oil in 1905.

Edgar Rye, North Central Texas Cartoonist and Journalist by Charles E. Linck, Jr. *(East Texas State University, Commerce, 1972; 121 pp., foreword, illus., paper, $4.00).*

A record of the cartoons and career of Rye (1848–1920), a public servant, itinerant journalist, and satirical artist during a pioneering era of manners and morals in cartoon.

The Face of Courage: The Rinehart Collection of Indian Photographs introduction by Royal Sutton, illustrations by Derek Fritz James *(Old Army Press, Fort Collins, 1972; no folios, list of photographs, $12.50).*

The dignity and character of the American Indian are readily communicated in more than one hundred beautifully reproduced portraits. The photographs were taken in 1895 at Omaha's Trans-Mississippi Exposition.

Frontier Woman: The Life of a Woman Homesteader on the Dakota Frontier by Walker D. Wyman *(University of Wisconsin, River Falls, 1972; 115 pp., illus., $4.95).*

A Wisconsin teacher who moved to Dakota in 1898, Grace Fairchild's creative force won her a place in South Dakota's Hall of Fame. The story of how she enlarged a claim of 160 acres to 1,440 acres is retold from original notes and letters.

Here Comes the Polly: A Biography of a Russian Built Gunboat by Ethel Anderson Becker *(Superior Publishing, Seattle, 1971; 128 pp., illus., index, $10.95).*

The recounting of a Russian gunboat-turned-tug, and of the history of the Pacific Northwest, the birth of industry in the Puget Sound area, and an account of the new way of life.

Continued on page 62

The Good Fight: The Life and Times of Ben B. Lindsey by Charles Larsen *(Quadrangle Books, Chicago, 1972; 308 pp., preface, notes, index, $10.00).*

The first biography of Lindsey, the best-known juvenile court judge in 1920s America. Trial marriage and the sexual revolution were among the many concerns of the liberal who was rated one of the ten greatest living Americans in a 1914 national poll.

They Carried the Mail: A Survey of Postal History and Hobbies by Matthew J. Bowyer *(David McKay, New York, 1972; 223 pp., intro., biblio., appen., $6.95).*

A new word, "postology," was coined by the author to encompass the wide spectrum of subjects oriented to mail that he covers in this anecdotal tome. Included are comments on post-mark collecting and church-state lawsuits.

Mary Vowell Adams: Reluctant Pioneer by Beatrice L. Bliss *(Mail Printers, Myrtle Creek, Oregon, 1972; 239 pp., illus., $7.50).*

A realistic account of an Iowa Methodist family's trek across the plains to Oregon in 1852, told from the female viewpoint. The authoress describes her great-grandmother's courageous meeting of daily demands despite an initial reluctance to leave the established farm home.

SUPERBEAST AND THE SUPERNATURAL

(Continued from page 17)

stampeding herd saw little danger.

L. C. Foquet confronting "herd after herd running into the wind" felt "as if they would run over us, however they dodged us everytime at the most skarish moment." George Brown, hide hunter, "never saw the time when they would not give the way for a wagon or a horseman." He once stood in front of a running group, but they gave him "plenty of room and I never had any fear of being run over." A camp cook lost on the prairies awoke at night to find a herd running right at him, but "by his shouting and action they swerved and passed him without injury." James Willard Schultz, fur trader and author, hiding behind a wagon from a stampede coming down through a Blackfoot encampment, saw them "threading their way between the lodges, nimbly jumping from side to side to avoid them, kicking out wickedly at them as they passed." After the herd had gone by, "no one had been hurt, not a lodge had been overturned." Men crossing the plains in wagon trains felt that the main danger of a buffalo stampede came from the stampede of their own mules and oxen to join the herd.

The running herds were less compact than people imagined they were; the beasts, more agile. They were easily turned by shots fired close by. Josiah Gregg contended that a single man could easily change their course, and C. W. Allen, a prairie soldier in 1869, claimed to have turned a stampede by firing shots.

Today as a person watches the Moiese herd switch and turn, dodging horseback riders, corral gates, and footmen, he can see buffalo are wary of anything in their path and tend to run around the obstacle rather than over it. They do not seem to be the most dangerous animal in North America, as Seton believed.

Charlie Russell based his yarn "Broke Buffalo" on another bit of widely told folklore—the superbuffalo's twice yearly migration. Charlie has it that: "There used to be a man on the Yellerstone . . . that catches a pair of yearling buffalo. He handles them humpback cows till they're plumb gentle . . . one day he decides to put them in a yoke. . . . Next spring a neighbor talks him into breaking sod with them. It's spring-time and they don't mind going north . . . but he can't turn them. They started north and that's where they're going . . . when he quits the handles they's still plowing north. . . . If he could find a country with seasons no longer than this field, they'd do for driving team. If he was fixed so he could spend his winters in Mexico and his summers in Canada, they'd be just the thing."

Mythical buffalo; mythical migration. Folklore told to account for the beast's strange absences, to account for the thousands of buffalo all moving in one direction. Such movement seemed like the seasonal migrations of birds: buffalo grazed in Texas in the winter and buffalo grazed in Montana in the summer; to the believer in superbeast they must be the same buffalo. Others saw in them a spawning tide: A railroad conductor thought all the herds going south died there—he'd seen none going north; some plainsmen believed that those going north were making a one-way journey to breed.

These men failed to realize that buffalo moved erratically within a range familiar to them, much as do other large mammals; northern buffalo stayed in the north, southern buffalo in the south. Buffalo have no inherent instinct to migrate long distances north or south such as is present in some birds—the bronze cuckoo, for instance, which can fly its great traditional route though raised away from its own kind. Tales of buffalo migration are folklore.

Artist George Catlin, writing of his 1834 Missouri River trip, believed in a piece of buffalo hocus-pocus rather than in common sense. He reported that while at a fur post at the mouth of the Teton, he had captured several buffalo calves by separating a calf from its mother, then covering its eyes with his hands and blowing up its nostrils—"a known custom of the country . . . after which I have, with my hunting companions, rode several miles into encampment with the little prisoner busily following the heels of my horse the whole way."

What Catlin didn't know was that the calf would have followed him without the hocus-pocus with the nostrils and the laying on of hands. Calves pestered numerous travelers by adopting them and trailing along behind. But he had seen it work with his own eyes—"I am now willing to bear testimony to the fact." Fifty-three years later, W. F. Hornaday solemnly reprinted Catlin's myth in his 1887 report to the Smithsonian

Institution, the report that for decades was the bible of buffalo behavior. The trappers on the Teton, pulling Catlin's leg, stretched more legs than his.

TO THOSE WHO BELIEVE in superbuffalo, no meat is like his, in all ways superior to beef. Goodnight tasted superior meat when he bit into a buffalo rib meat, so did Buffalo Jones—but they had meat to sell. Yet others, with no market in mind, testified to the wonderful flavor. "I still think buffalo meat the sweetest meat in the world," said Peter Burnett, remembering his journey to Oregon. Such comments reveal more about the quality of nineteenth-century beef than the quality of buffalo meat. Today a quarter of buffalo is in no way as palatable as a quarter of purebred ranch beef. Buffalo tongue and choice cuts are perhaps tastier and tenderer—the cuts frontiersmen most often ate—but the other cuts are inferior, and the stew meat is almost inedible—stringy, tough, unpleasant on the tongue. A few such meals and a man understands why mountain men and Indians took mostly choice meat from the carcass.

But the supermeat myth continues, promoted today by the National Buffalo Association, private raisers of buffalo for the market. L. R. Houck, its president, proclaimed that: "Young buffalo . . . make a tremendous market. The trouble with consumer taste for buffalo in past years has been that the usual source at barbecues and special dinners was an old herd cull. But get a young buffalo in its prime, and, let me tell you, you won't find any meat better. A T-bone—and you get one more from a buffalo carcass—is tremendous." T-bones, yes; chuck roast, no.

The association repeats other old myths in the same newspaper story: "Buffalo enthusiasts claim buffalo range better than domestic cattle and are not bothered by extreme heat or cold. They say they are a greater converter of feed than domestic animals. . . . 'They'll put on five pounds a day on less consumption of feed than a domestic steer,' Houck says. 'And the butchered carcass will dress out with more usable meat than the usual 50 to 60 percent in a domestic steer.' "

Here's a ring of the professional folklore of Buffalo Jones, Charles Goodnight, Pablo and Allard, and Pawnee Bill, a folklore designed to increase the marketable value of commercial herds. At the present price of $925 for a yearling cow, it seems the association has succeeded where others failed; yet, buffalo have boomed and busted on the market before when folklore outran demand.

Buffalo folklore continues. A forester told me a Buffalo Jones Arizona cattalo experiment failed because cattle couldn't give birth to humped buffalo calves—but a calf has no hump at birth. A writer claims that since buffalo grazed into the prevailing winds, they moved in a circle three hundred miles in diameter, causing one herd to summer where the other had wintered. Recently an old-timer claimed in his reminiscenses that every buffalo in the world today is a descendant of seven calves captured by Buffalo Jones in Texas in the 1880s.

Not so.

Larry Barsness, *author of* Gold Camp *(Hastings House, 1962), is now preparing a book on the American buffalo, to be published by the Amon Carter Museum of Western Art, Fort Worth. The author teaches writing at the University of Montana.*

SCIENCE AND ART IN THE SOUTHWEST

(Continued from page 11)

On July 6, 1962, in the detonation called Sedan, a thermonuclear device was exploded 635 feet down in sand and gravel. It was in the 100-kiloton yield; that is, it equalled 100,000 tons of TNT. The detonation produced a crater about 1,300 feet across and 321 feet deep. Less than 10 percent of radioactivity escaped, to fall close by the crater. On April 26, 1969, Boxcar was 3,800 feet deep in rhyolite. It was the first United States test of a megaton or more; a megaton equals 1 million tons of TNT. Boxcar yielded 1.2 megatons, formed a depression 900 feet in diameter and 275 feet deep, produced earth tremors and thousands of small aftershocks, caught the attention of seismologists, and startled would-be carefree people in Las Vegas, more than a hundred miles away.

Though Plowshare is a minor program at the test site, the AEC sees Sedan and other detonations in this series as preliminary studies that may lead to vast ditch-digging projects, cutting railroad and highway routes through mountains, gashing a sea-level canal across an isthmus in Central America, recovering oil and natural gas from deep-lying strata, in-situ leaching of copper ore, and creation of underground storage chambers for water, gas, and the wastes of industrial and urban civilization.

At this site, where mortal men officially plan a deterrent against a nuclear attack on the United States or massive revision of the earth's surface, they also look into the means and the possibilities of human survival. Since 1960 the UCLA Laboratory of Nuclear Medicine and Radiation has worked in Rock Valley to observe the effects of low-level gamma radiation on desert animals kept in three fenced areas of twenty acres each. A herd of Hereford cattle bearing the AEC's registered brand roam the whole test site, and the Environmental Protection Agency regularly examines the herd for radionuclide uptake and radiation effect. The agency also runs an experimental dairy farm, which is probably the most meticulous, most monitored farm in the history of North American agricultural pioneering. Pumps bring up ancient water from more than a mile down, and men raise rye and especially alfalfa in irrigated soil. They irradiate the crops with various radionuclides and feed the forage to a thriving herd of Holsteins—far from the uncontaminated grass and water of their ancestral duchy. Experts then analyze the cows' milk. The end result is knowledge of protective actions that

men can take to reduce the amounts of radionuclides that get into human foods.

The huge Nevada Test Site, almost lost in the spaces of the Southwest, easily hidden from U. S. highways and commercial air travel routes, is one of the most guarded and deeply studied areas on earth. It is of absolute technological importance to the nation's military and foreign policy. It exemplifies a new, twentieth-century use of desert "waste" space, where in the past the area was only of casual importance to prehistoric Indians and to the modern Paiutes; to cattlemen, who developed water holes and built corrals; and to miners, who extracted silver and tungsten ore.

It is evident that the life of the Southwest has definitely changed since the days of the original inhabitants. One of the special glories of the great deserts has been the sense of virgin landscape, however plain, as far as eye could see in transparent air, or the sense of canyons free of all litter or evidence of humanity except perhaps a cave dwelling of ancient men and women. However, twentieth-century man *has* arrived, and in his hands lies the future of this region. He will progress and develop, yes; but he must move ahead wisely, with caution, never losing sight of the heritage of the American Southwest.

Richard Lillard, *chairman of the department of English at California State College, Los Angeles, is author of* Eden in Jeopardy *(A. A. Knopf, 1966);* American Life in Autobiography *(Stanford Press, 1956);* The Great Forest *(A. A. Knopf, 1947); and* Desert Challenge: An Interpretation of Nevada *(A. A. Knopf, 1942).*

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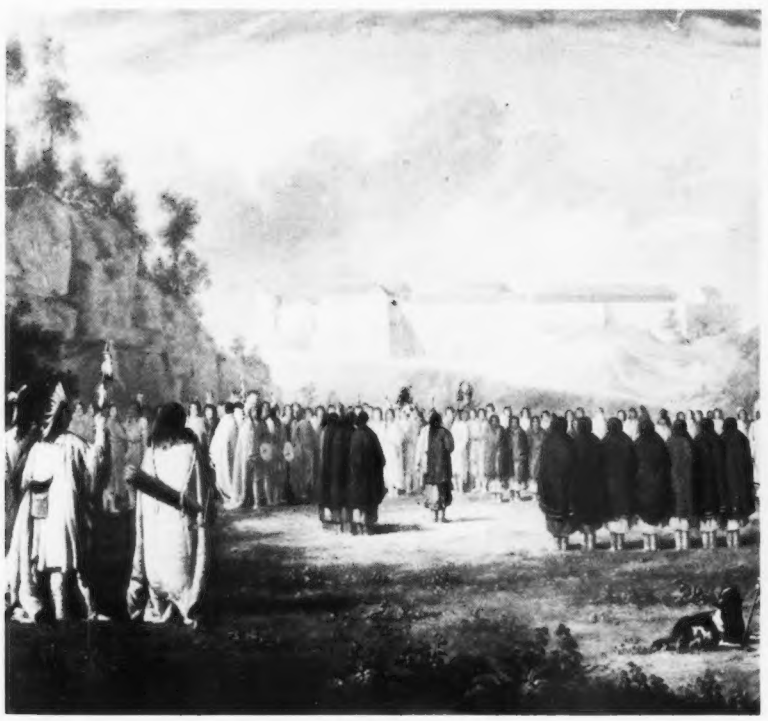
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